JOURNAL OF AMERICAN INSURANCE

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April 19, 1927.

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On Friday, April 15th at 7:15 A. M., your bus No. 725 struck and practically demolished my Chevrolet Sedan.

At 12:15 P. M. the same day your Insurance Company, the Michigan Mutual Liability Company, delivered to me a car of the same model in perfect mechanical condition to replace the car wrecked but five hours previously.

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I congratulate you in having your insurance in an organization that will so efficiently foster the good will of the public.

Faithfully yours

Mark W Savage

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The Fire Prevention Work of Stock Fire Insurance Companies

This is the title of an article by H. A. Smith, President of the National Fire Insurance Company of Hartford, Conn., appearing in "The Annals" for March, 1927, and from which we take the following:

Some years ago it was realized by executives of the leading stock fire insurance companies of the country that, although the business profited because fire is an ever present possibility in all walks of life, the incineration of material wealth was reaching proportions which threatened economic disaster. As a consequence they authorized The National Board of Fire Underwriters, which today represents two hundred and ten stock fire insurance corporations, and is supported by them, to formulate a campaign along engineering and educational lines that would result in safeguarding life and property to the fullest extent. Such a program was at once undertaken and it has developed steadily in scope and intensity with the years.

The program of our stock company friends is to be commended. The MILL MUTUALS have been "safeguarding life and property to the fullest extent" for more than fifty years, and it is a pleasure to know that the trail they blazed is being followed by others.

MILL MUTUAL insurance and FIRE PREVENTION are synonymous.

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ROBERT A. BARBOUR

THE name of Robert A. Barbour for many years has been a potent force in Mutual Insurance circles. His wide experience has given him a thorough knowledge of all angles of insurance problems and the Federation of Mutual Fire Insurance Companies is proud to have him as a member of the Governing Board. Mr. Barbour is Secretary-Treasurer of the Berkshire Mutual Fire Insurance Company and Hampshire Mutual Fire Insurance Company, both of Pittsfield, Mass. He entered the business world in the offices of Jordan, Lovett & Co., in Boston, in 1892, and has been with his present companies since 1897.

The Service of Fire Insurance

From an Address Delivered at Annual Meeting, Chamber of Commerce of U. S. A., Washington, D. C., May 3, 1927

By JAMES S. KEMPER

Manager Associate Mutual Insurance Companies, Chicago, U. S. A.

NO expounding is necessary to demonstrate the close relationship of Insurance with American business needs. There is no better evidence of it than the existence and success of the Insurance Department of the Chamber of Commerce of the United States. So intimate indeed is the Connection and so vital, that it is not inopportune on this annual occasion to discuss briefly some aspects of the service of fire insurance. This we shall attempt to do from a standpoint looking to the future. There will be no claim of novelty for the facts and figures employed. They are the necessary background against which to sketch roughly some observations as to the service fire insurance can give and the service business should expect in this year and in the years to come.

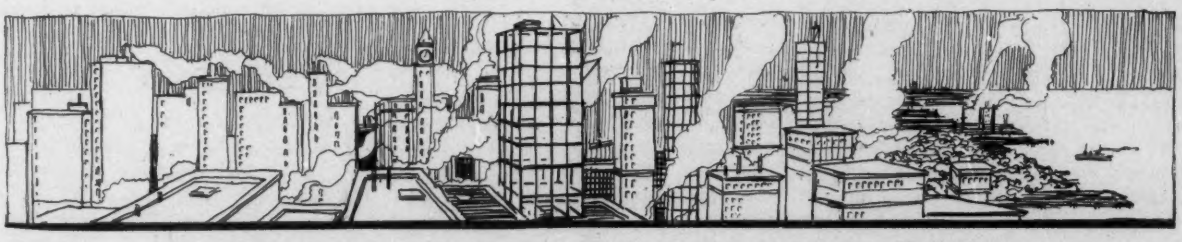
First, is the service of information, of knowledge. Particulary the smaller units of American business can and should be better informed as to fire insurance companies, their organization, their finances, their scope, their rates, their methods, their facilities for service. The policyholder should know the disposition of his insurance dollar and be thereby inspired with confidence to avail himself further of the advantages of fire insurance service. The larger concerns whose volume is enough to justify their own insurance executive or department have through their own research and study an advantage in this respect. The same advantage should be secured for the smaller businesses, through co-operative efforts and with the whole-hearted and generous assistance of the fire insurance companies. Assistance of this kind is exemplified by the bulletin service of the Insurance Department of the Chamber, supplementing the educational and publicity work already undertaken by many of the insurance companies.

James S. Kemper

IT IS heartening to comment upon the active and ever increasing interest taken in insurance matters by trade associations. Many of them have aggressive committees studying insurance matters as they affect their own trade or industry and advising and informing their membership accordingly. To a greater extent than at present the fire insurance companies should work with these trade groups and furnish them freely with data useful in solving their particular problems best and most economically. In fields where co-operative interest in fire insurance and co-operative action in fire prevention have long been in effect, as for instance in the cotton goods, flour milling and lumber industries, the results in prevention of loss and reduction of cost have been amazing. Many other industries can profit similarly.

Increased knowledge and understanding on the part of business men of large or small affairs, is bound in the long run to react favorably upon the fire insurance companies. It will make their own problems, dependent as so many of them are for solution upon public opinion, easier of solution. In this day when peanut-stands have cash registers, and bootblacks adding machines, there should be no disposition on the part of insurance to "play down" to any segment of American business. The smallest unit is capable of absorbing most of the essential data that can be given to it. The process will result in the demand for more service. This is particularly true in regard to collateral lines such as windstorm and use and occupancy. The surface is not even faintly scratched. The larger the volume the better and cheaper the company can serve and the better and cheaper the insured will be served.

Education of the public is especially needed in new things, such as, for example, the hazards introduced by airplanes, by radios, by oil burners. This has the tremendous effect of having the companies and the public realize that these are common problems which must be worked out together, and not merely new opportunities for



Superior Construction of Building Means Less Fire Hazard and Lower Rates Naturally for You

the companies and their agents to collect premiums, to "sell something."

In connection with the service of informing the public, nothing is more important than that the fire insurance companies shall obtain general statistics more accurate, more comprehensive and more fitting than those in some cases now generally adopted and employed. Figures as to loss of life and loss of property in fires are widely used in fire prevention propaganda. Yet we find them open in too many cases to grave doubt, so that the effect on the intelligent reader or listener is the reverse of convincing. For example, for several years it had been estimated by other authorities that the annual death toll by fires was close to 15,000. The National Fire Waste Council now estimates that it is in the neighborhood of 3,500.

THE effectiveness of the device of calling attention to the fire loss of property in the United States compared to that of European countries could be made much more effective by digging out the real facts and not presenting mere per capita figuers. On a basis of per capita *wealth*—which is the only proper basis—there can be little doubt that the figures will show not only that this nation compares favorably with others, but also that our own record relatively is improving from decade to decade. Per capita figures whether used for local or international comparisons are always misleading. For them we should substitute data based upon insurable values and taking into account climatic, economic, sociological and other pertinent conditions. We need have no fear of the American public letting up in fire prevention efforts in the face of optimistic reports. With us, truly, "nothing succeeds like success," and a good showing will inspire us with increased efforts, "to beat the record."

In considering its most obvious phase, that of furnishing indemnity, the service of fire insurance must be viewed from various angles which will be increasingly numerous as American business grows in size and scope. However you define fire insurance, the fact remains that basically it is a plan for collecting from the many to pay the losses of the few. And in the aggregate it has become a tremendous plan, comparable, in the extent of its collection of premiums from and rendering of service to its policyholders, to a nation collecting taxes and in return furnishing protection and rendering beneficent services to its citizens.

Fire insurance companies have at risk in the United States close to two hundred billions. They collect annually around a billion dollars. Profiting by this enormous outlay, equal perhaps to one-tenth of the annual increase in our national wealth, the American public gets in return by-products worth far more than the actual indemnity, which alone amounts to approximately half a billion.

Prize Contest Closes June 18th

There is still time to send your letter on

"What Is Fire Insurance?"

Three Prizes
$50.00, $35.00 and $15.00

Donated by the Millers Mutual Fire Insurance Company of Texas

Remember—Your letter should contain not more than 450 words and be mailed by midnight June 18th, 1927.

JOURNAL OF AMERICAN INSURANCE

GREATEST of these by-products is stability. Picture the mingled sluggishness and confusion that would result were American business suddenly to be deprived of fire insurance indemnity! Consider how extension of mercantile credits depends on this service. The vast building operations of the last decade to the extent that they were made possible by real estate mortgage loans—and it was a great extent—were made possible also by the service of fire insurance. The banking structure of the nation, the confidence to make loans aggregating upwards of forty billions, rests on fire insurance service.

Insurance has come to be recognized as one of the most important elements entering into the question of credit. Credit requires stabilized conditions and insurance is one of the great stabilizing forces. Fire insurance as a stabilizer has a salutary effect upon business not only in the security it supplies as a collateral to credit but in reducing fire waste.

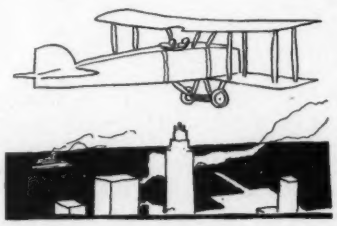
The margin of profits in business has been greatly lessened due largely to sharp competition so that it has become an absolute necessity that losses from bad debts be reduced to a minimum. The business man who gives credit on goods without insurance as a protection assumes a double risk because in addition to the ordinary credit risk there is the risk of fire.

Fire insurance service affects every department of business. As illustrating the surprising scope of this effect, take at random a few scattered exampes. By allowing credits in the insurance rate for superior construction, fire insurance makes possible reductions in rentals for desirable space. The installment plan of buying, which for good or ill is now general, can only exist and expand with the aid of fire insurance service. It is believed that in the future tax rates may be reduced on buildings which have been made as nearly fireproof as possible on the grounds that such a building not only is apt not to require fire department servives but also actually arrests the progress of fire commencing in an adjacent structure not so well built. It is not doubted that the requirements of the companies in the matter of records for loss adjustment purposes will continue to have a wholesome effect in stimulating the use of appraisals and the improvement of inventorying in many businesses.

Similarly, one may at random mention numerous points at which fire insurance service favorably touches municipal and other public affairs. It has been and will be increasingly influential in the

promotion and improvement of public fire departments. It will have an effect on many details of city planning in the future, including wide streets, open squares and parks and other provisions against catastrophes. It will influence types of buildings, architectural design and materials in our rural districts, villages, cities and suburbs. It will as in the past affect the electrical and other inspection services and the building department activities of towns and cities.

IN a different category but none the less in an important way, fire insurance service affects city and state government in the matter of prevention of arson. Thanks in no small measure to the activity of the companies, this hideous crime has come far more under control than in the past. Adoption of the Model Arson Law advocated by the Chamber of Commerce of the United States and rigorous eradication of over-insurance should make it rare in the future. The insurance companies' scrutiny of financial statements, their credit investigations and their emphasis on the factor of



Airplane Fire Fighting Equipment Is Already Here

"moral risk" contribute notably to suppressing and removing dishonest elements in business.

Among general public benefits accruing from fire insurance service mention should be made of ownership of homes by families of limited means. In 1920 there were in the United States nearly twenty-five million homes, of which over ten million were occupied by the owners. Over four million were mortgaged, for an aggregate amount of over eleven million dollars. It is fair to assume that fire insurance made it possible for most of the owners of mortgaged homes to leave the renter's class. In this connection, it is interesting to note that over 90 per cent of the assets, which total five and one-half billion dollars, of the twelve thousand building and loan associations in the United States are invested in mortgage loans protected by fire insurance policies. The fire insurance companies themselves

The Modern Nero Would Use An Extinguisher Instead of a Fiddle

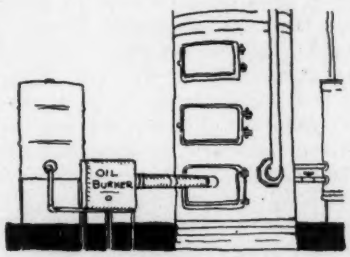
have large investments in mortgages, though not comparable to those of the life insurance companies, the latters' loans of course protected by the fire insurance companies. Incidentally, the purchasing power of the army of people engaged in the fire insurance business is a factor in the nation's prosperity.

Churches and schools both benefit by the indemnity and the fire prevention services of the fire insurance companies. Without fire insurance there would be a complete loss to the churches annually of six million dollars representing the value of their property that is burned. Fire insurance service and indemnity is behind the vast properties of our school systems, which in 1922 required housing for over twenty-three million pupils, taught by over seven hundred thousand teachers, at a total annual expense exceeding one and one-half billion dollars.

LASTLY, we come to the fire insurance service of fire prevention. The American public likes music on occasion, including the fiddle, but we are much less complacent about fires and other disasters than were the Romans of two thousand years ago. (Today Nero would discard his fiddle and handle a hose or extinguisher instead.) Nothing in this mechanical age would more amaze our forebears than the elaborate and effective precautionary and combative measures we adopt to prevent and to defeat fire, no longer meekly accepted and endured as an "act of God." It is estimated that from the smallest extinguisher on the wall of the home kitchen to the largest fire fighting outfit, we spend a billion dollars a year for the conservation of life and property, including fire and accident prevention.

This is the result of a gradual but basic change in our conception of the function of insurance. The emphasis has shifted from indemnity to prevention. Prevention of misfortune as well as the mitigation of the effects of misfortune is the recognized goal. Occasionally a reactionary word is heard. Happily this is not often. On the contrary it is generally recognized that when the products of man's hand and brain burn, mankind irrevocably loses. Besides the direct loss there is the enormous indirect loss. Businesses are disorganized and destroyed. A study of the effects of fires on one hundred concerns showed that "forty-three did not resume business, seventeen which were able to furnish financial statements before the fire no longer could do so, fourteen suffered a reduction of 30 to 66 per cent in their credit ratings, and only twenty-six were unaffected as to credit rating, they too suffering serious loss in other ways."

This is not the place nor is there time to discuss the technical fire prevention service of the fire insurance companies. With many it has become the major function of the organization. As a result, in



Oil Burners Need Safety Devices of a Positive Efficiency

certain classes the loss ratio has become nominal, permitting carriers to make large reductions in the insurance costs of their policyholders. The fire waste of ten billion dollars in the last fifty years, three-quarters of that sum in the last twenty-five years, represent proportionate losses of national wealth that will not be per-

(Continued on page 29)

What Are "Stock Rights"?

Explanation of This Valuable Privilege Which If Properly Exercised Means a Nice Extra Profit

By F. H. SCHWARZ

Assistant Treasurer, Merrimac Mutual Fire Insurance Co., Andover, Mass.

THIS is an age not comparable with any preceding period in the history of business expansion. The demand for additional working capital is constant and the sources of supply are manifold and seemingly inexhaustible. Time-tested and profitable corporate enterprises find the investing public in a receptive frame of mind with respect to programs of expansion, and obviously the present somewhat inflated stock market prices are conductive to such financing.

Worthy common stocks are growing in popularity, especially where such issues enjoy the sole right to the distribution of profits and are not subordinated to any form of bonded indebtedness or preferred stock issues. Invariably such issues of common stock sell at a generous premium or we may say they are selling above par value. This popularity in the majority of cases is deserved not only from the standpoint of income, but the subsequent issues of stock which find their creation in programs of expansion, yield to the holder of prior issues increased profit in the form of so-called stock "rights."

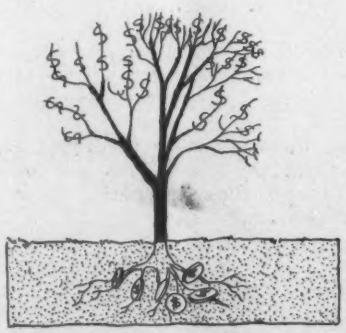
A STOCK right may be defined as the right of a stockholder to subscribe to one or more shares of stock in a corporation usually at a price less than the prevailing market price. The difference between such cost and the current market selling price is in a sense an extra dividend to the stockholder but does not decrease the surplus of the corporation. On the contrary we frequently find that certain forms of financing increase the Surplus Account.

With the growth of our insurance institutions there is a constant demand for investments that are both safe and profitable and there are very few companies without investments in desirable stocks. The question of stock rights is, therefore, placed before us repeatedly.

THE question is frequently asked as to how the market value of so-called stock rights is determined. Let us take a hypothetical case where a corporation has an outstanding capital stock consisting of 5,000 shares common stock,

Dollars Put into a Business Is Expected to Bring a Certain Return

par value $100.00. Let us assume that the stock is listed on the stock market at $150.00. The necessary preliminaries have been completed and the capital is to be increased by the issuance of 1,000 additional shares at a cost of $125.00 per share. Rights to purchase stock of this issue are offered to present stock holders at the rate of one new share to every five shares of prior issues owned by the stock holder. What is the value of each right or each one-fifth right?



Money Is at the Root of All Enterprise and, Rightly Used, Will Fertilize Any Commercial Project

Cost of new share, 1,000 @ $125.00	$125,000
Market value of old shares, 5,000 @ $150.00	750,000
	$875,000

To obtain the approximate value per share divide the total of $875,000 by 6000 being the total number of shares:

$875,000 ÷ 6000 = $145.83 approximate value of each share.

To obtain value of "rights" deduct the cost of a new share from the approximate value as follows:

Approximate value	$145.83
Cost of new shares	125.00
Total value of right to purchase one share	$ 20.83

The value of each fractional share can be obtained by dividing the number or rights necessary to purchase one share into the above total.

20.83 ÷ 5 = $4.16 or approximate value of each fractional right.

IN a preceding paragraph the statement was made that under certain forms of financing the surplus of a corporation is increased, and the above is an exemplary case. The total par value of the new stock in this instance is $100,000 and this amount should be shown as a liability under the caption of Capital Stock. However, in addition a premium of $25,000 was received from the sale of this issue and this amount is usually credited to Surplus Account. Not infrequently do we find that a premium of this kind is carried in accounts under other headings, and some take the stand that this amount does not truly represent Surplus. Elbert Hubbard said "Truth and fact are some times totally different things. Untruth enters when we reason wrongly from facts."

Florida Compensation Bill

HOUSE Bill 475, providing for a Workmen's Compensation law on the basis of a competitive state fund, has been introduced in the Florida Legislature and favorably reported by the Committee on Labor.

Farmers' Mutual Fire Insurance

Continuing a Series of Articles on the Problems of Underwriting In Rural Communities

By V. N. VALGREN

Agricultural Economist, U. S. Dept. of Agriculture

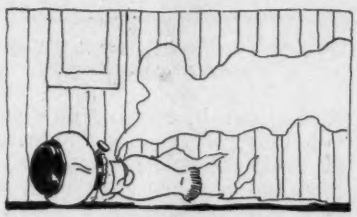
MUCH is being written and said on fire prevention, and particularly right now on farm fire prevention. As with many other problems, there appears to be considerably more said than done about it. Confronted with this situation, one almost hesitates to add to the say on this subject, for fear of further unbalancing the relationship between noise and results.

Yet ideas must precede action, and ideas are most conveniently conveyed by words. The few ideas that I shall attempt here to set forth bear on the relationship of farmers' mutual fire insurance companies to the problem of farm fire prevention. Do these companies have any interest in this problem? Can they do anything about it, and if so how?

But first of all, is the problem of such magnitude as to be worth considering?

THE usually quoted figure for the annual farm fire loss is $150,000,000. Some of those who use this figure assert that it is a conservative estimate and that the actual loss is nearer two hundred million. Without any definite proof to the contrary, I hesitate to dispute these assertions. Unless the estimate itself, however, rests on a better foundation than some of the comparisons that have been used to bring out the magnitude of this "farm fire loss" it may involve a considerable margin of error. Thus, the Chairman at a recent meeting of the Agricultural Committee of the National Fire Waste Council after quoting the above-mentioned estimate, made the following statement according to a mimeographed copy of his address:

"The toll which the fire demon exacts from American farmers will pay their annual interest bill on all borrowed capital with more than $50,000,000 left to be applied on principal each year. It is equivalent



Beware of Toppling Old Lamps

to one-sixth of the net income of all farmers in the United States in 1924. It amounts to $26.29 for every farm in America."

Now the farm mortgage indebtedness alone is somewhere between nine and ten billion, according to the best figures available. The personal and collateral bank debt of farmers has recently shown a tendency to decrease while the mortgage debt was mounting, but it is probably still not far from three billion. In addition to long-term mortgage credit and short-term personal and collateral credit, the farmers use annually a large volume of credit from stores and dealers of various kinds for which no satisfactory figures are available. Estimates place it at one billion as minimum. The average rate of interest on this borrowed capital is about six and a half per cent. Hence the amount paid annually by farmers as interest is not less than $800,000,000 and it probably materially exceeds this sum.

IN COMPARISON of the estimated fire loss with farmers' net income the speaker again sailed wide of the mark. Neither farmers nor any other economic group could survive on an average net income per family of $158 per year, or six times the annual fire loss according to the statement quoted. The annual amount paid by farmers as interest on borrowed capital is at least eight times the assumed amount, and the average net income in 1924, while distressingly low, was at least four times the amount assumed by the speaker. These comparisons have, of course, no direct bearing on the fire loss estimate. On the other hand, they do not add to our confidence in the estimate itself.

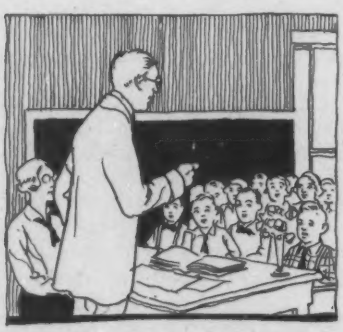
But let us assume that the annual farm fire loss is nearer a hundred million than a hundred and fifty million. This is my own guess based on such data as I have been able to find. To the actual fire loss, whatever the exact figure may be, there may properly be added a considerable item for consequential loss represented by temporary forfeiture of use and occupancy, or as insurance men would term it, rental-value loss. To this may be further added an indefinite sum for the toll of life and injuries which these fires annually exact. The farm fire loss, therefore, most certainly merits the serious consideration not only of those connected with agriculture, but of all who have any hu-

Buildings Should Be So Placed that Sparks Will Not Fly from One to Another on Prevailing Winds

manitarian interest, or give thought to our national welfare.

To argue that the farmers' mutual fire insurance companies are not concerned with the prevention of farm fires would be almost equivalent to saying that they have no interest in their own business. Their business is to alleviate loss burdens and it is their obvious duty to do this in the most effective way. To merely distribute fire losses among the members without any attention to the causes of their occurrence suggests inefficiency and short-sightedness regardless of how conscientiously such distribution is carried out. To deal with fire-loss burdens effectively the evil must be attacked at its source. Causes of fires must be removed or at any rate reduced to a minimum, and means for checking in their incipiency such fires as may still occur must be provided to such extent as circumstances permit.

CONCEDING then, as we must, that the farmers' mutuals have a direct interest in fire prevention — that they cannot function fully or worthily without it, how do or can they give effective expression to this interest? Some of the ways of doing this have already been discussed in the preceding articles in this series. The companies can encourage the removal of certain causes of loss by a proper method of classification of risks which puts a premium upon safety and penalizes the tolerance of needless hazards. They can assist members in the



Children Should Be Taught How to Avoid Fire Dangers

discovery of hidden or overlooked defects in buildings and to some extent insist upon the elimination of such defects. They can educate their members in safe practices in the use of heating and lighting apparatus, as well as in other devices or operations involving fire or heat. They can emphasize the need for simple fire fighting apparatus on the farm, to some extent they can insist upon such apparatus being provided,

The Farm Fire Fiend Collects A Toll of More Than $50,000,000 Annually

and they can in certain cases aid in obtaining needed fire fighting equipment at moderate cost.

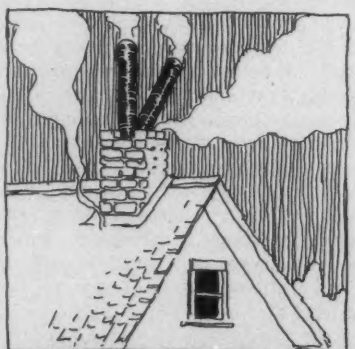
How do we know that these things can be done? Because every one of them has been done by progressive farmers' mutuals, and to some extent also by larger companies doing a general fire insurance business.

The relatively local farmers' mutual has many advantages, however, over larger general-writing companies whether mutual or stock, by reason of the concentration of its business in a limited area. Cost of inspection is materially less for a company with a given number of risks all in the same county, or in a few contiguous counties, than for a company with the same number of farm risks scattered, as is frequently the case, over a score or more of states.

ESSENTIALLY the same advantage is enjoyed by local mutuals in educational activities in fire prevention and fire control. Even where a number of general-writing companies resort to co-operative effort, as has wisely been done in a number of cases, their combined constituency rarely involves such a percentage of the farmers in a given area as the average farmers' mutual can boast. Furthermore, a proper response to fire prevention campaigns is more readily obtained by the local mutual since the members look upon it as their own organization, and know that any reduction in the losses of the company will be promptly reflected in the cost of their insurance.

All groups or classes of companies can, of course, distribute fire prevention information and advice by mail to their policy-holders or members at the same cost regardless of location of such policy-holders. But when other means are called into play such as use of country newspapers, speakers at various kinds of farmers' meetings, or talks to the children in country schools, a concentrated constituency makes possible multiplied results as compared with a widely scattered one. In the former case, eighty per cent of the homes reached may be those of members, while in the latter case perhaps less than one per cent of such homes will represent policy-holders. In other words, to reach the same number of policy-holders an interstate general-writing company may have to use a multitude of newspapers and speakers as compared with a local farmers' mutual.

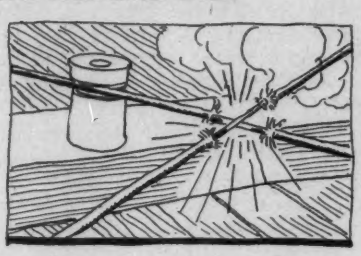
Let me make clear at this point that there is no desire either to discourage or to belittle the work in farm fire prevention that is being done by representatives of larger general-writing companies. They have demonstrated a willingness and ability not only themselves to contribute to the solution of the farm fire problem, but to join hands in this work with all other interests. My purpose in the foregoing paragraphs has been to point out to farmers' mutuals their peculiarly advantageous sit-



Defective Chimneys Are a Prolific Source of Rural Fires

uation in reference to farm fire prevention work and if possible to stimulate them to more general and more determined efforts. Too many of these companies are overlooking their opportunities and neglecting their duties in this work.

The bread that they cast upon the waters in the form of fire prevention work, comes back to them decidedly more surely as well as more quickly than is the case with similar efforts by companies with a thin sprinkling of policy-holders over continental areas.



Open Wiring Is Often a Menace

But more specifically, what can the farmers' mutuals do to reduce farm fire losses and how can they do it?

THEY can advise a member or prospective member about to build or rebuild, how to locate his buildings with reference to each other so that the dwelling and the barn, usually the most important buildings on the farmstead, will not be in line with the prevailing winds in the locality, and will be separated by at least one hundred feet of clear space. Where the prevailing winds for example are northwest and southeast, they can tell him to locate his buildings so that the barn will be one hundred or more feet northeast or southwest of the dwelling. This will lessen the danger of sparks from the chimney igniting the barn, and will also reduce the chance of the burning of one of these buildings taking the other with it. In addition it will reduce the probability of disagreeable odors from the barn surrounding or penetrating the dwelling.

They can advise him how to build his chimney so that it will be safe and serviceable, and how to safeguard the woodwork under and behind the stove to avoid needless flue and fire-place dangers. They can point out to him the value of lightning rods and the possibility of making a steel roof serve the double purpose of shelter and lightning protection, by means of proper grounding. If he plans to install electricity for lighting or other purposes they can point out the importance of having the wiring properly done and inform him that while with good wiring electric lights are among the safest lighting devices, careless wiring may make them the worst hazard in his home. Much of the above advice will apply to all members without reference to the construction of new buildings.

The officers of farmers' mutuals can in various ways bring home to their members the dangers of improper use and handling of gasoline and kerosene, of careless disposition of ashes, of smoking in and about barns, of the use of matches that strike anywhere or ignite by being stepped upon or bitten by rodents. The use of safety matches only is doubly important on the farm because of the danger that they will be dropped where accidental lighting will set fire to hay or straw with a resulting loss of the barn and perhaps other property. Such officers can also emphasize to their members the need of care in storing hay or other fodder in barns before it is thoroughly dry, and where thorough drying is found impossible, to lessen the danger of spontaneous ignition by the use of salt mixed into the fodder and by special efforts to provide free ventilation of the storage room.

WHAT has been here said about the officers of a farmers' mutual applies particularly to the secretary since he is usually the only officer who is paid for giving all or a substantial part

Ash Cans Have Bad Reputations

of his time to the business of the company. In so far as officers may need more detailed information than they possess on safety methods and devices it can quite easily be obtained from the fire marshal of the state, The National Fire Protection Association at Boston, The Underwriters Laboratories at Chicago, Rural Engineering Departments of the State Agricultural Colleges, or the U. S. Department of Agriculture.

Little technical information is needed to urge the keeping on hand of simple equipment for checking fires in their incipiency. A ladder by which the roof of the house may be readily reached should be available. Such a ladder is in any case needed for various purposes but it should always be kept in a readily accessible place when not in use. Other simple fire equipment such as barrels of brine and buckets cost but little and chemical extinguishers are within the means of at least most farm families. Some companies are buying extinguishers at wholesale and distributing to members at cost, others are providing lightning protection at wholesale prices.

These warnings and advice can be given orally when taking ap-

A Smoke May Cost a Fortune

plications for insurance or when reinspecting risks during the policy term. They can be furnished by means of printed circulars, and by articles in local papers either dressed up as general-interest articles or given in paid advertisements. They can be stressed at annual meetings of the company, in special talks at other meetings or gatherings, and in brief talks before school children who will to some extent carry the messages into the home and themselves be influenced by what they have learned. Reasonable standards of safety can to a certain extent be encouraged and even enforced by classification and inspection of risks.

By studying and analyzing the loss experience of his company an officer will soon have concrete and near-at-hand illustrations which may be used in fire prevention work. This annual loss data should be properly tabulated and furnished to every member as a part of the annual report. Special lessons learned from outstanding individual losses may well be added. Concrete illustrations are more effective than mere assertion in convincing members of fire dangers.

(Continued on page 30)

This Mutual A Half Century Old

Ohio Mutual Insurance Company of Salem Has Record of Fifty Years of Continued Success

AFTER the Chicago fire, there was an urgent demand for reliable fire insurance and relief from burdensome rates. John R. Vernon of this city had been associated with M. R. Robinson for years in a local agency, and with his support and encouragement and that of Hon. W. D. Henkle, and other prominent Salem people, and of I. H. Myers of Wooster, Mr. Vernon secured the necessary organization subscriptions and insurance orders to file articles of incorporation under the laws of Ohio, Oct. 26, 1876, for the Ohio Mutual Fire Insurance Company of Salem.*

The original subscription papers, pledging $50,000, required certificates of justices of the peace that the subscribers were financially good, and many were certified by D. M. Carey and Samuel Hardman of Salem, and Abraham Zimmerman in Green Township.

THE company was fortunate in obtaining as incorporators: J. Twing Brooks, J. W. Fawcett, W. D. Henkle, T. C. Boone, M. R. Robinson, John Pow, J. M. Woodruff, Allan Boyle, J. K. Rukenbrod, Furman Gee, of Salem; Charles Townsend, of Leetonia; Nicholas Way, Lisbon; J. G. Lacock, Salineville, and J. W. Reilly, Wellsville.

The required endorsement of state officials, supplies and office location being arranged, the company began its active business operations April 2, 1877.

The first office was in the Pow building, later in the Trimble and moving to the company's own building at No. 96 East Main street, erected by it in 1897.

M. R. ROBINSON was the first president and he served until his death in 1878, being succeeded in January, 1879, by Furman Gee until his death in 1901, when he was succeeded by J. R. Vernon, still serving.

In the first year of the company, Hon. J. T. Brooks acted as vice president, succeeded in 1878 by Furman Gee (who became president in 1879) and was then succeeded by Col. T. C. Boone until his death in 1894, being succeeded by J. M. Woodruff until his death in 1916, then being succeeded by Louis H. Brush, continuing.

The present Board of Directors consists of Mr. Vernon, since organization; Henry Bohl, Columbus, Ohio,

J. R. VERNON

President of Ohio Mutual Insurance Co.

since 1879; Louis H. Brush, since 1901; J. Ambler, since 1907; D. B. McCune, since 1910; H. M. Silver, since 1914, and F. R. Pow, since 1918.

NOW deceased directors include M. R. Robinson, Alfred Wright, Col. T. C. Boone, W. D. Henkle, Richard Pow, Furman Gee, J. M. Woodruff, Thomas Bonsall, Samuel Grove, Sr., John Pow, W. H. Daggett, C. C. Snyder, A. H. Harris, all of Salem; J. W. Canfield, Canfield; M. E. Douglas, Mansfield; Lee McBride, George W. Morgan, and S. R. House, Cleveland; C. P. L. Butler, Columbus; D. Bachelder, Galion; P. E. Fleck, Columbus; B. Barrett, Wooster; Enos Goble, East Palestine; J. D. Raney, Youngstown, and Nicholas Way, Lisbon.

These were people of high personal character and business prominence as to appeal to the confidence and good judgment of the community and insuring public.

From its inception Mr. Vernon was the active manager, and had the the title of secretary, until 1901, then taking the office of president, which he still retains; J. Ambler then becoming secretary, after being in the company's employ since March, 1889.

Early employes of the company were Miss Mary L. Weeks, George W. Henderson, Homer C. Boyle, W. H. Daggett and Henry P. Ambler, all now deceased. K. L. Webster was in the employ of the company for 16 years, later becoming treasurer of the Citizens Savings bank of Salem. Raymond K. Yates has been a valued employe since 1910.

The first Policy No. 1 was issued to J. Woodruff & Sons, Inc., of Salem, was renewed until its dissolution, and then continued on the plant for W. J. Clark Company until its discontinuance in 1920. This policy is preserved in the "Old Curiosity Shop."

Among the original 285 subscribers surviving, are Mr. Vernon and his wife; M. L. Young, and L. B. French.

THE office opened the year the telephone was invented. There were very few efficient waterworks or paid fire departments, and fire engines were in an experimental period, mostly pumping from cisterns and wells. Rates were empirical. There were no fire proof or even steel construction buildings, or automatic sprinklers. Uncontrolled conflagrations were common and large portions of the buildings which became ignited burned up completely.

The utmost care had to be exercised in accepting only moderate liability in conflagration districts, in total loss risks or in any location which might give the company an excessive loss in any single fire, good lessons having been learned from the Chicago and other large fires, of not making a company subject to large losses.

The company did not start without great effort, had to meet the problems and hazards of the times, but with a firm faith in friends and associates, reliance in business integrity, and an unusually high grade of agents, the work and business were undertaken under extremely conservative practice.

(Continued on page 31)

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From Notched Stick to Actuarial Table

MEN of figures, men of method and precision, met recently to confer at the Edgewater Beach Hotel, Chicago. They represented the accountants, office managers and statisticians engaged in mutual casualty and automotive insurance. The insuring public has little contact with these men, but their activities are essential to its security. It is not our purpose here to discuss the problems which occupied their attention, problems largely technical, but, in a general way, to stress the importance of their work, its vital relation to the whole scheme of modern life and business.

Back in the beginning of things Homo Sapiens took a stick and notched it with a flint. He had learned, first to count upon his fingers. Now he transferred that count to a record. What was it? Perhaps the number of times the sun had risen between two events; perhaps the number of full moons from the first sign of vegetation to the first fall of snow; perhaps the number of animals or of human enemies he had slain. Presently he discovered that a charred stick from his fire would make a black mark on a lighter surface.

SO THE first accountant was evolved, and so the foundation was laid for the science of statistics. Now there is no department in life to which these useful mysteries are not applied. The story of accounting and statistics parallels the growth of knowledge; they have been the tools of progress, the instruments of research, the indispensable means of analysis and prediction in all fields of inquiry which deal with the measurable. From the housewife with her family budget to the staff of experts figuring costs and other vital factors in a great industry; from the trained nurse keeping the history chart of the patient—temperature, pulse, respiration—to the actuarial adepts working out tables of life expectancy and casualty hazard, the germinal idea of primitive man's notched stick has developed and ramified until it is within the facts to say that modern civilization in a very real sense rests upon accounting and statistics.

Bookkeeping was once a simple process whereby we kept track of what came in and what went out, at stated periods subtracting one from the other to learn where we stood. There was value in that. If more was going out than coming in, obviously something was wrong. Common sense told us we faced a situation which could not continue. But to say what was wrong was quite another matter, and the need for this specific information led to an elaboration and improving of the process. It became analytical. It began to ask questions about what goes out—or cost. It so systematized its curiosity that it became able to say "Here is the point where you are losing money. Eliminate this leak; reduce this expense, and you will begin subtracting outgo from income, instead of the other way about."

And in that knowledge there was vastly greater value. We used to say sometimes "All business is a gamble." But scientific accounting has been taking more and more of the chance element out of business, and increasing its intelligent control. Space lacks for further illustration; this may be said, however—No man now who makes any pretense to be a business man can ignore the importance of competent accounting. And we would emphasize the adjective "competent," for to rely upon incompetence is like consulting a fortune teller, who advises you by the way the cards fall or the tea-leaves cling to the bottom of the cup. There is, perhaps, no place in business where incompetence can be more dangerous.

NOR can modern business afford to ignore the statistician. History repeats itself, and this is a mathematical world. The statistician is a mathematical analyst of history, if by history we mean all the facts relating to a particular matter for a given period of time. He reduces history to numeral values, by which it is possible to make comparisons, and from which significant deductions may be derived. He deals in averages and ratios. It is a fascinating and intricate profession where the amateur is likely to go far and perilously astray. It demands of its devotee a dispassionate, scientific attitude of mind and a very thorough proficiency in the handling of figures. He must be coldly and unprejudicedly honest. The statistician with a theory, a preconceived conclusion, which he is eager to prove is a dangerous man. He must seek his facts, compile, analyze and compare them with a single-minded desire to discover the truth, and not with a desire to support what he wants to believe to be the truth.

The honest and capable statistician is the modern prophet. He can come nearer to foretelling the probable than any seer or augur whoever dreamed vision or consulted the entrails of a sacrificial victim. He does not guess. He builds on facts.

The expert accountant, the skilled statistician—these are the indispensable right and left hand of modern business. They have made insurance possible. They have brought to it scientific exactitude. Without them it wanders in a wilderness of unforseeable and incalculable risks. With them it travels the highroad of knowledge.

The Journal of American Insurance offers in the articles which appear from time to time in its columns the mature conclusions of men who are foremost in the realms of accounting and statistics. Mutual insurance has developed in its field a vast body of information based upon experience and research. This is the material for constant study by trained minds, and it is the aim of the Journal to give first to its readers the valuable conclusions which these minds reach. Primarily of insurance significance, much of what is written is applicable to other spheres of business in which our readers may be interested.

Life Lights on a Business Background

"Water, Water Everywhere!"

By S. J. DUNCAN-CLARK

"AS a householder Uncle Sam ought to be ashamed of himself."

There was some warmth in the exclamation with which my traveling salesman friend, Bob Harris, greeted me as he parked himself on top of a pile of newspapers occupying the only other chair in my working cubicle.

"Why all the indignation?" I asked.

"I left New Orleans six days ago, headed for Chicago, and I have been traveling ever since. Heaven knows where I have been. I lost track of geography and time after the third day out. I thought I was making a rail trip over-land, but I found I was at sea. The one thing I am thankful for is that the train didn't try to be a submarine. It had to be everything else which aquatic travel requires. People talk about the South being dry—well, I wish they could have seen what I have seen; 'Water, water everywhere, and not a drop to drink!' Say, talking about drink you don't happen to have——."

"No," said I, anticipating the finish of his inquiry, "I don't. This office obeys the law."

"I feared as much," he answered with a grin.

"BUT, to come back to the water," I said, "you don't hold Uncle Sam responsible for an act of Nature, do you?"

"Act of Nature, nothing," replied Bob, whose phraseology is often more colloquial than elegant. "This is a leak in the national plumbing—that's all, and any householder who allows a leak in the plumbing to go unremedied year after year is a bum proprietor. Why, the flood story is as much an annual feature of the news columns as the frost bite of the Georgia peach crop."

"Yes, but Uncle Sam has tried to mend the leak. He has built levees along the Mississippi—spent millions on them. The old man has tried, you must admit that."

"All right, I admit he has tried, and I admit that his engineers have done a good job so far as they have been allowed; but admitting all that the fact remains that we have been passing thru the worst flood experience in the country's history. Just think of it, 250,000 people homeless! I wish you could have seen what I saw as I journeyed up here on a train which was swimming most of the time—thousands of houses submerged, whole families floating on rafts, poling themselves along in search of a dry landing, everything in the world they owned lost under the water. There hasn't been anything like it, I'm told, since 1844.

"YOU see what happened was this. Some twenty-five states drain into the Mississippi Valley, and the old Mississippi is the only channel to carry off their excess water. There are 240 tributary rivers in the valley region, which covers a million and a quarter square miles. When they flood at different times the channel gets away with it, spilling over some here and there; but when they all flood at once, as they did this year, the channel just can't hold the surplus—levees and everything go."

"Where did you get all this information?" I asked, because Bob as a rule, is shy on any facts except such as relate to the brand of cigars he sells.

"There was a man on our train, member of the Mississippi Valley Association. I got talking to him in the observation car, and he handed me the inside dope on the situation."

"Well, don't your facts prove that Uncle Sam did his best, but that Nature is stronger than he when she goes on the rampage?"

"No they don't prove anything of the kind. They prove that Uncle Sam hasn't done his best. What we need, as this man said, is a national flood control policy on a broad scale; a policy that will take into account all the factors in causing floods, and that will utilize all the possible remedies. It stands to reason that a country which built the Panama Canal can handle this job if it goes at it right. This expert chap told me that part of the trouble lay in the piecemeal nature of the levee work. The main levees Uncle Sam built, but the lateral levees were built by local government bodies, an dthe lateral levees are lower and less resistant than Uncle Sam's. They let the water in around the main levees and so weaken them."

"Well, that's not Uncle Sam's fault," I protested. "Put the blame where it belongs on the local people."

"It is your Uncle's fault, because no improvements can be made on any navigable rivers without his consent. If he hadn't consented to the local plans they couldn't have been used. The job is his job. All levees ought to be higher and set back further on each side so as to let the river make a broader and deeper channel. Levees should be standardized. Then there should be provision made for water storage up where the floods start, and spillways on the lower Mississippi. Think of all the power that is going to waste in these floods; think of all the water which our arid lands need that is being lost. That's bad housekeeping.

"And reforestation—that's another feature of the program. These floods are tending to get worse because we have stripped the hills of trees, and there's no forest sponge to hold the rains.

"And one more thing; Uncle Sam or somebody ought to stop the land speculators selling muck lands to foolish farmers. Why you can't even raise a disturbance on some of the stuff that's been passed off for hard-earned savings. Let the excess water spill over those bottoms. Convert them into fish and game preserves. That would make them of some real use."

"Well, of course, that's a big program; too big for anybody but Uncle Sam. And you may be right in saying he ought to tackle it. But it would cost a lot."

"Say, this thing now is costing us $300,000,000 in damages, $10,000,000 in charity and our self-respect as an efficient nation. I'm going to write to my Senator and tell him what I think about it. And, in the meantime, I'm going to hunt another office where they don't have so much respect for the law. In spite of all I'm dry. I lost my flask in that darned flood."

A Tall Match

Heshe: "Did you hear about the wooden wedding?"

Shehe: "I'll bite."

Heshe: "Two Poles were married."

—Blue Jay.

The Creative Spirit

Value of Keeping the Mind Open to New Ideas and What This Attitude Means to Mutual Companies

TO THE student of the administrative branch of business it is increasingly apparent that there is a gradual transformation and awakening from the painfully selfish individualism and provincial conservatism that characterized many business men previous to the last decade.

The non-progressives are in the minority and experience teaches that this attitude is not infrequently due to self deception. They conscientiously feel that their ultra-conservatism is a cautious liberalism when in reality it is a feeling of contempt for anything that is contrary to inherited opinions. They are in that class who labor under a false sense of security and the type who after accepting one idea tame it and keep it as sort of a watchdog to frighten all other ideas away. Then, too, there is that smaller group whose adherents are avowedly illiberal and whose minds are likewise moulded to the form of one idea.

We are not at this time so much concerned about the non-progressive individual. Time will either correct his perspective or he will continue to suffer from what we might properly term arrested development. What primarily interests us is the preservation of the proper influences which will continue to strengthen, stimulate and inspire the progressive majority—those who have contributed and are contributing so liberally to the general welfare of the great Mutual Insurance fraternity.

WHAT are the potent influences that have cemented our business relationships, broadened our perspectives, and created a sympathetic understanding? The pessimist is always ready to tell us that business is sick and his friend, the pseudo business psychologist, is ready to prescribe a panacea consisting of a strange mixture of ancient philosophy and modern idealism. The difficulty with his remedy is that the philosophy is too ancient and the idealism is too far from realism. Generally speaking, business never was in a healthier state, but this does not mean that we should be over-optimistic and lessen our energies to improve it. The invaluable policy of eternal vigilance is our greatest benefactor.

It is rumored that the 20th century business man lacks imagination and if by this is meant the absence of day-dreaming, we think the rumor is well founded. The energetic business man has no time for unproductive theory and philosophy and often over-shoots the mark. He wants a mental yardstick by which he can measure and thus obtain a comprehensive and intelligible picture of what expensive experience has given him.

The
FIRST ANNUAL
Accounting
Office
Management
and
Statistical
CONFERENCE
of the
FEDERATION OF MUTUAL FIRE INSURANCE COMPANIES
Will Be Held
at Hotel Cleveland
Cleveland, Ohio
Monday and Tuesday
June 27th and 28th
Every Company Should Be Represented at This Important Conference

In every field of business there is an increasing appreciation for the creative spirit and we are slowly emerging from the shackles of tradition. From infancy to old age human beings place a higher value upon the things that are the results of their own creative genius. The child doesn't readily destroy the toy it has made with its own hands, and the mature man finds a lasting satisfaction in the results of well directed effort and thought. Every influence that makes us more alert and makes us think deeper kindles the creative spirit.

We need the external as well as the internal impetus to bring out the best within us. The man who restricts his business life to the immediate confines of his company, the man who finds no time for the interchange of ideas with his business contemporaries, the man who feels sufficient unto himself, cannot cultivate to the fullest extent the creative spirit.

IT HAS taken many centuries for man to overcome distrust for his business contemporaries and his honest compromise has its reward in the manifold benefits of co-operation. Expensive experience has taught him that there is no better fountain from which to draw a wholesome stimulus than the medium of well conducted and purposeful inter-company conferences. There are those who will assert that such programs have been overdone and they are willing to dismiss the subject after only casual consideration. The doubts of the skeptic and the sneers of the cynic who lurks behind have never hastened but always retarded the forward march of business. Inter-company co-operation, like international co-operation, is still in its infancy. When we learn to work together, the business world and the world at large will be a better place to live in. As the speed of a convoy cannot exceed that of its slowest ship, so the progress of business may be impeded by the tardiness of a small minority of its members. Then, too, as in a convoy, the faster and more powerful ships may take others in tow. Those who are content to observe and reflect in silence and who are not avowedly opposed to co-operative effort may be stimulated by the leadership of the more advanced

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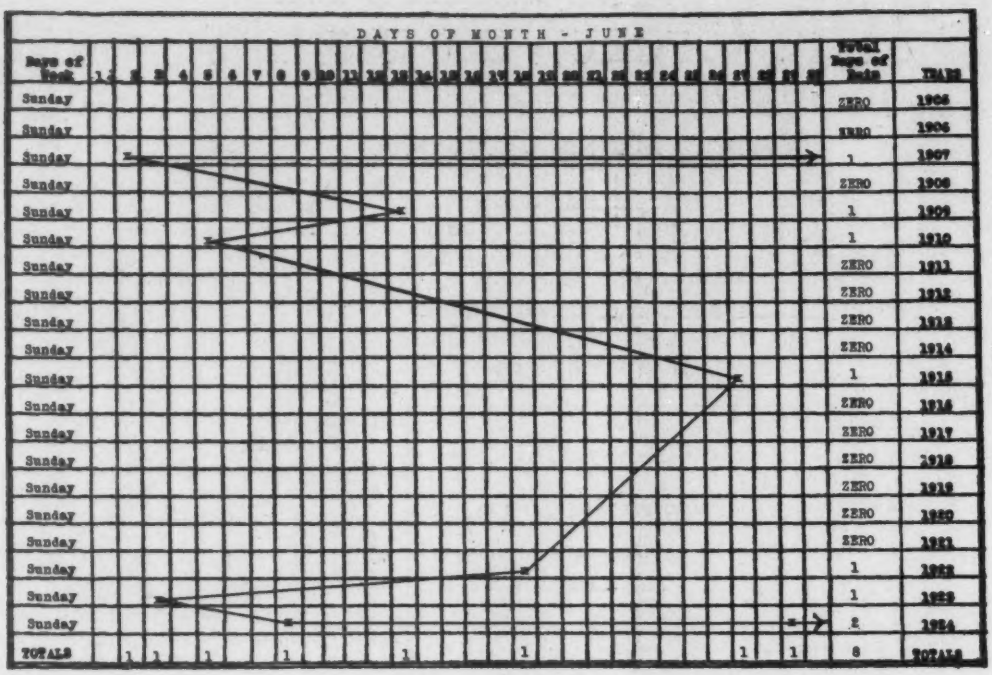

Plate No. 1—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Sunday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

The Rainfall Hazard

Fundamental Factors Related to This Weather Risk and Their Practical Application to Underwriting

By COLONEL JOHN P. FINLEY

Consulting Meteorologist and Manager National Storm Insurance Bureau, New York City

Article IV. Rainfall Diurnals.

THIRD SECTION.

IN REFERENCE to the laws of atmospheric circulation we have shown the relation of the sources of rainfall to the development and movements of cyclonic and anti-cyclonic areas. The occurrence and distribution of daily rainfall is found to be a function of the progressive velocity of these areas, across the United States from west to east, under the influence of the axial revolution of the earth. We have learned that during this revolution our atmosphere is carried along with the earth, which does not slip from under it.

Our atmosphere must be present in uniformly stable proportions, all over the earth, in order that all forms of life on its surface may be preserved. The constituents of the atmosphere are the basic constituents of all conditions of physical life on our terra firma.

In this connection we must not overlook the fact that we have two envelopes of the solid surface of our planet—the liquid and the aeriform. That they exhibit many analogies, owing to the mobility of their particles, their currents, and their atmospheric relations, which combined with their contrasts, show the great difference in the condition of their aggregation and elasticity. Life in the aerial ocean is confined to the lower, denser and more saturated strata of air, while life in the liquid ocean exists in all strata and at all depths. Being slow, small and gradual in temperature changes, the ocean acts as a general equalizer and moderator of climates.

Although the surface of the ocean is less rich in living forms than that of the surface of the continents, investigation of its depths discloses greater richness of organic life than is to be found in any other portion of our planet. The application of the microscope to further the analysis of water life increases in an astonishing manner the rich luxuriance of animal life in the ocean, and reveals to the astonished senses a consciousness of the universality of life.

The waters swarm with countless hosts of small luminiferous animalcules, which, when attracted to the surface, by peculiar meteorological conditions, convert every wave into a foaming band of flashing light. These conditions are especially noticeable in tropical waters. The abundance of these marine animalcules and the animal matter yielded by their rapid decomposition, are so vast that the sea water itself becomes a nutrient fluid to many of the larger animals that exist therein.

THE aerial ocean presents certain classes of natural phenomena which manifest the most intimate and significant connection with each other. They are dependent upon the chemical composition of the atmosphere, the variations in its transparency, polarization and color, its density of pressure, its temperature and humidity, and its electricity. The air contains in oxygen the first element of physical animal life, and besides this great benefit it possesses another of nearly equal importance, that of conveying sound; a faculty by which it likewise becomes the conveyor of speech, and the means of communicating thought, and consequently of maintaining social intercourse. Can we imagine human

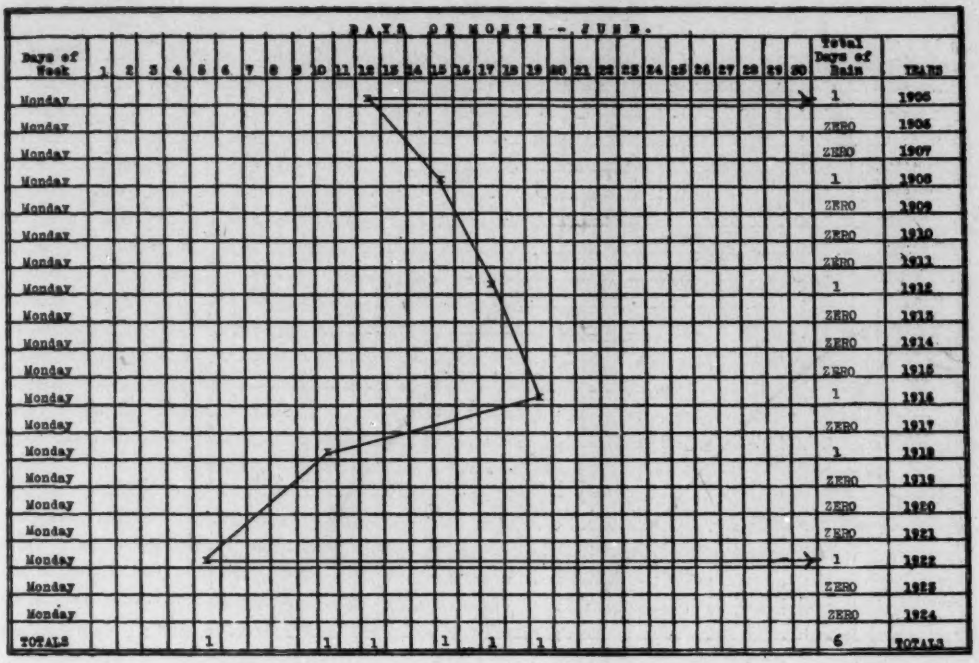
DAYS OF MONTH - JUNE.
Days of Week
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Total Days of Rain
YEARS
Monday 1 1905
Monday ZERO 1906
Monday ZERO 1907
Monday 1 1908
Monday ZERO 1909
Monday ZERO 1910
Monday ZERO 1911
Monday 1 1912
Monday ZERO 1913
Monday ZERO 1914
Monday ZERO 1915
Monday 1 1916
Monday ZERO 1917
Monday 1 1918
Monday ZERO 1919
Monday ZERO 1920
Monday ZERO 1921
Monday 1 1922
Monday ZERO 1923
Monday ZERO 1924
TOTALS 1 1 1 1 1 1 6 TOTALS

Plate No. II—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Monday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

beings existing in a soundless desert?

The relative quantities of the substances composing the strata of air accessible to animal life have, since the beginning of the nineteenth century, been brought, through exhaustive chemical analysis of the atmosphere, to a high degree of perfection. We may easily conceive that changes in the oxygen, held in solution in the sea, produced by microscopic animal organisms, may be attended by alterations in the strata of air in immediate contact with it.

The admixture of carbonate of ammonia in the atmosphere may reasonably be considered as older than the existence of organic beings on the surface of the earth. The sources from which carbonic acid may be yielded to the atmosphere are most numerous. In the first place mention will be made of the respiration of animals, who receive the carbon which they inhale from vegetable food, while vegetables receive it from the atmosphere. The exhalation of carbonic acid by plants, during the night, while they inhale oxygen, is not taken into account, because the increase of carbonic acid from this source is amply counterbalanced by the respiratory process of plants during the day.

In the next place carbon is supplied from the interior of the earth, in the vicinity of exhausted volcanoes and thermal springs, from the decomposition of a small quantity of carbureted hydrogen gas in the atmosphere, and from the electric discharges of clouds which are of most frequent occur-

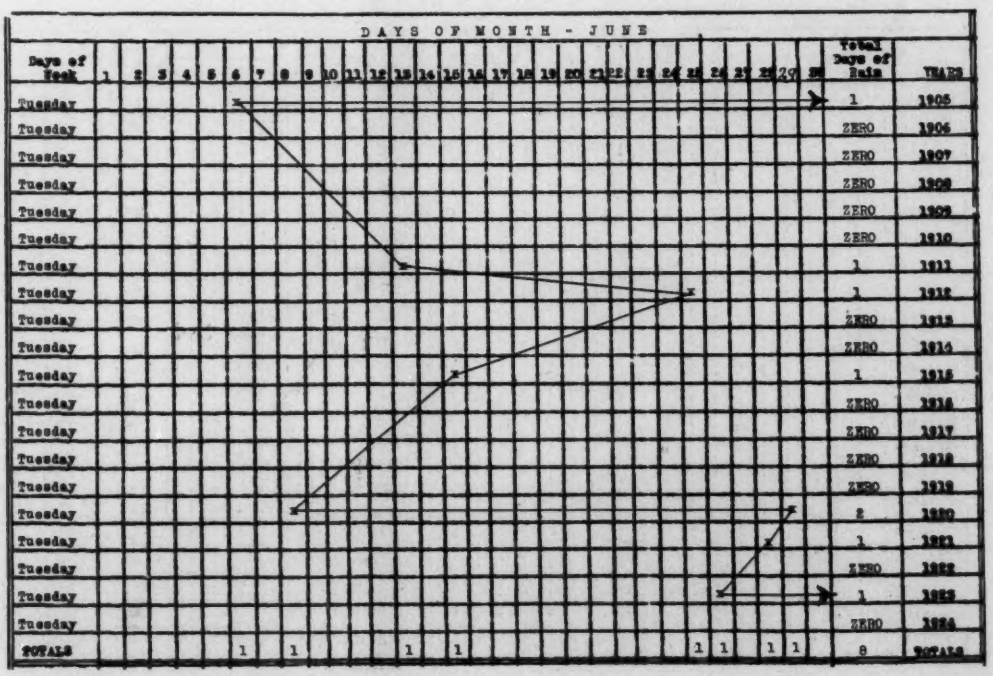
DAYS OF MONTH - JUNE
Days of Week
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Total Days of Rain
YEARS
Tuesday 1 1905
Tuesday ZERO 1906
Tuesday ZERO 1907
Tuesday ZERO 1908
Tuesday ZERO 1909
Tuesday ZERO 1910
Tuesday 1 1911
Tuesday 1 1912
Tuesday ZERO 1913
Tuesday ZERO 1914
Tuesday 1 1915
Tuesday ZERO 1916
Tuesday ZERO 1917
Tuesday ZERO 1918
Tuesday ZERO 1919
Tuesday 2 1920
Tuesday 1 1921
Tuesday ZERO 1922
Tuesday 1 1923
Tuesday ZERO 1924
TOTALS 1 1 1 1 1 1 1 1 8 TOTALS

Plate No. III—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Tuesday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

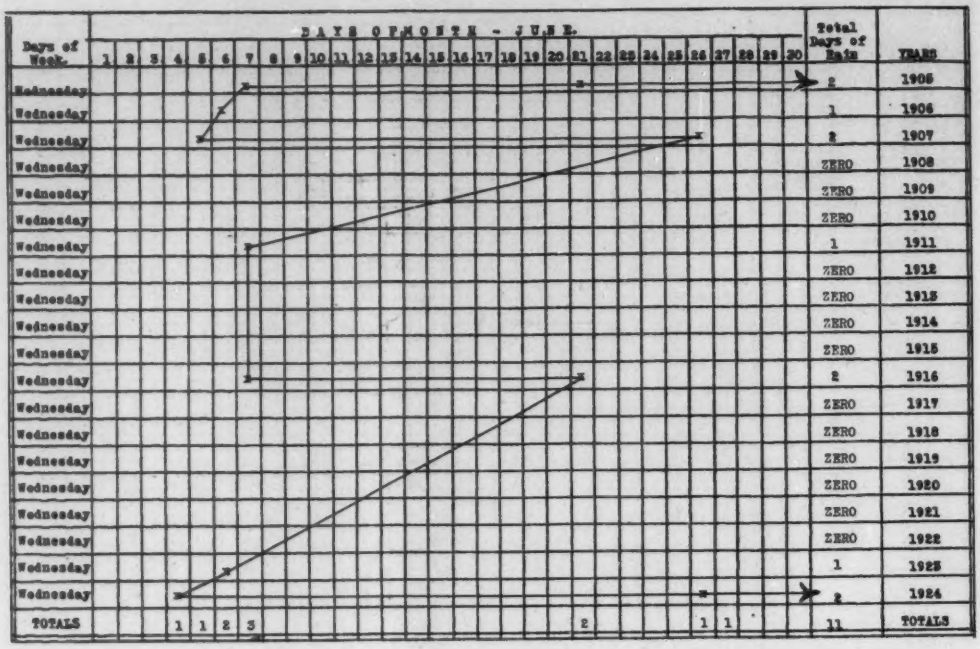

Plate No. IV—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Wednesday, with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

rence within the tropics. Besides these substances, which we have considered as appertaining to the atmosphere, at all heights that are accessible to us, there are others accidentally mixed with them, especially near the ground, which sometimes, in the form of miasmatic and gaseous contagia, exercise a noxious influence on animal organization. Ammoniacal and other nitrogenous vapors, sulphureted hydrogen gas, and compounds analogous to the polybasic ternary and quaternary combinations of the vegetable kingdom, may produce miasmata. Fogs which have a peculiar smell at some seasons of the year indicate these accidental admixtures in the lower strata of the atmosphere. Winds and currents of the air caused by the terrestrial absorption of the sun's rays, carry up to a considerable elevation, solid substances reduced to a fine powder. There are numerous examples of dust being forced into the air, sometimes to great heights, as in the case of volcanic eruptions, in some instances affecting the color of the sky for weeks and even months. The air over large cities invariably shows hundreds of thousands of solid particles, to the cubic centimeter, held in suspension and carried about by the shifting winds, horizontally and vertically; in villages and towns this ratio reduced, and in the open country a further diminution; also the ratio reduced with altitude.

IN OUR discussion the importance of the structure of the air, its constituent elements and its contents, concerns the occurrence and distribu-

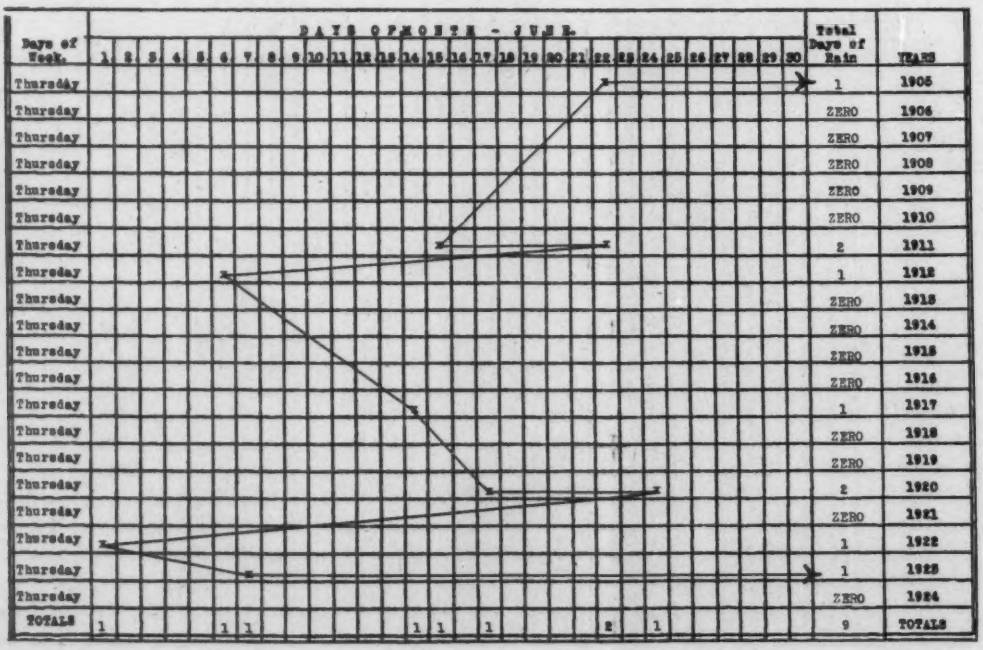

Plate No. V—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Thursday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

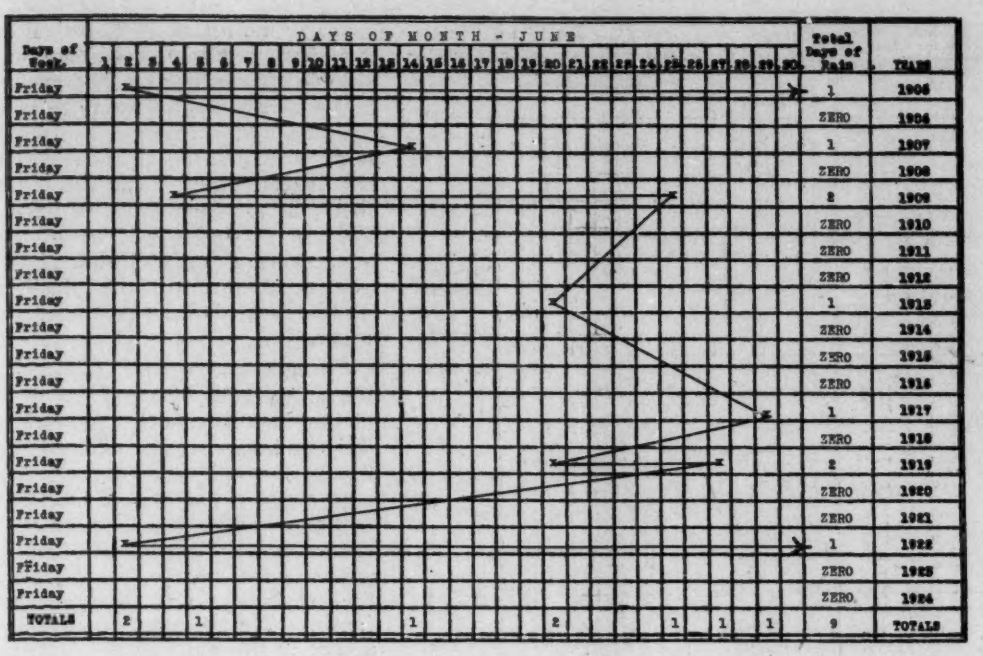

Plate No. VI.—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Friday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

tion of precipitation as rain and snow. Rainfall is extremely local in character and the line of demarcation between rain and its absence is often sharply and strangely abrupt, although the overhanging clouds appear to strongly indicate further condensation. Tyndall has shown in his researches on the decomposition of vapors, that air rendered dust-pure has not the property of diffusion, except in large volumes of free air, therefore light rays are generally invisible while passing through transparent air.

Aitkin established the important fact that cloudy condensation in our atmosphere can only take place in the presence of dust; that every cloud particle was previously represented in the atmosphere by a dust particle, on which the vapor forming the cloud particle condensed. Thus dust-motes appear to furnish the free surfaces that seem to be necessary in the condensation of the particles that form fog, clouds, drops of rain and flakes of snow. In the laboratory, condensation in dust-free air, may take place on electrons and electrified atoms. To what extent, if any, such precipitation takes place in the free air has not been demonstrated. Humphreys has shown that the first considerable rapid expansion, and therefore decided volume-cooling of humid air in a receiver, if recently admitted unfiltered, is quite certain to produce a miniature cloud, subsequent expansions of the same air produce fewer and fewer fog particles. If the old air is removed and unfiltered fresh air admitted the condensa-

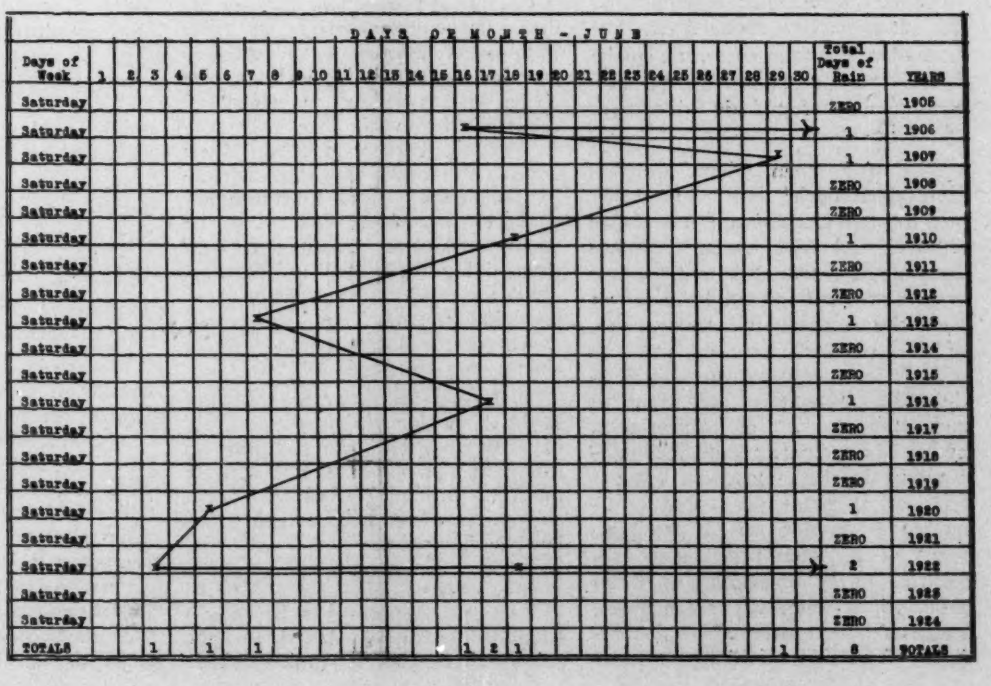

Plate No. VII—Rainfall Diurnals—Rainfall Occurrence. Correlation of days of the week (Saturday) with a tenth (0.10) of an inch or more of rainfall between the hours of 2 P. M. and 9 P. M. During a period of twenty years (1905 to 1924 inclusive) at U. S. Weather Bureau Station, New York City.

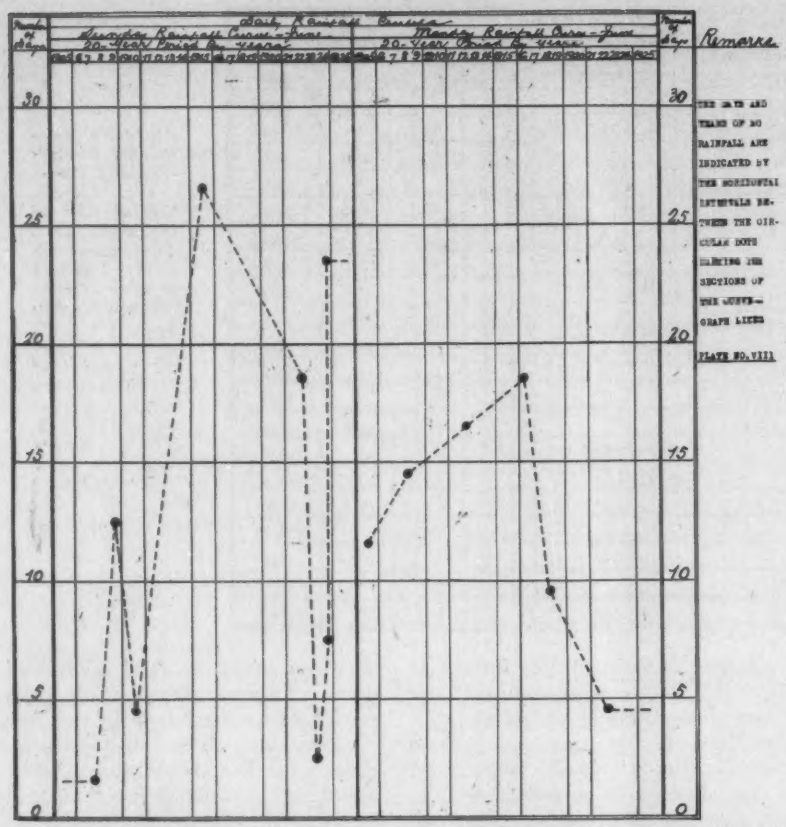

Plate No. VIII.—Observations made by automatic self-recording raingage and checked with a direct-measurement non-recording raingage. Both U. S. Weather Bureau standard instruments located on the roof of station building 394 feet above sea-level. The circular dots (●) in rainfall curve mark the day and year of measured and recorded precipitation. The curve-graph lines are formed on a uniform basis, and progress from left to right.

tions occur again as before; but if the fresh air enters through an efficient filter, condensation remains as difficult as in the exhausted air. The admission, however, of a little smoke restores to the exhausted, and confers upon the filtered air full powers of condensation.

Obviously, then, cloud droplets form about nuclei that cannot easily pass through mechanical filters of fine texture, and microscopic examinations of the residue left on the evaporation of these droplets have shown the nuclei to consist, in large measure, of dust particles, both mineral and organic. Hygroscopic gases, such as the oxides of sulphur and of nitrogen, may also act as condensation nuclei, but ordinarily there is abundant dust in the atmosphere (thousands of particles per cubic centimetre) to provide for all precipitation. It is often urged that free electrons in the air also act as nuclei about which water vapor condenses, but, as this type of condensation requires about a four-fold supersaturation, its occurrence in the open seems extremely improbable.

Volume condensation may be induced in the atmosphere by any cooling process; whether by radiation, as on clear nights; mixing warmer with colder masses of air; movement of relatively warm air over cold surfaces, as in the case of winter south winds (northern hemisphere); or expansion, owing either to convection or barometric depression. But the cooling process has much to do with determining the extent of the condensation, the kind and amount of precipitation from it, and its general appearance, according to which, chiefly, it is classified.

Surface condensation as exhibited in the deposition of dew, the forming of hoar-frost, and the sweating of ice-pitchers all show that atmospheric moisture promptly condenses upon any object whose temperature is below the dew-point.

IT IS very important to be clearly and fully impressed with the peculiar circumstances under which rain may form and fall to the earth. No effort worthy of confidence and capable of providing the information and understanding necessary to cope with the insurance problems involved in the writing of rain and flood cover, will become effective and successful that fails to comprehend the nature and the varying conditions of the antecedents of rainfall, both local and general, together with the principles of the condensation of atmospheric vapor.

Through the agency of atmospheric elements the earth has been divided into land and water areas. This has been a process accomplished through geologic ages of time. By such means it has become inhabited with physical life, it has become productive to sustain such life, and it possesses the resources to maintain life indefinitely in all of its myriad forms. The greatest atmospheric agency in this amazing development is the process of Volume-Condensation of atmospheric water vapor. It has made the oceans, the clouds, the fogs, the rivers, the perpetual areas of snow and ice, and the great glaciers of the polar regions.

Tyndall says, "Every occurrence in nature is preceded by other occurrences which are its causes, and succeeded by others which are its effects. Therefore if we trace backward without any break in the chain of occurrences, the rivers and glaciers to their real beginnings, we will finally reach the fire of the sun." What a paradox! The "fire of the sun" producing the enormous ice-caps of the polar regions, and the other vast areas of perpetual snow and ice, that characterize some of the uninhabitable portions of our marvelous planet.

In thus contemplating the boundlessness and immeasurability of Nature, what a sublime image of the infinite is presented. We are lost in the eternal play of the atmospheric elements and in the profundity of rainfall occurrence and distribution.

We are in the midst of a demonstration of these two important factors, in the unparalleled flooding of the Lower Mississippi Valley, over the 1000-mile stretch from Cairo to New Orleans. Within this area the Father of Waters is fed by its largest tributaries, the Missouri, Ohio, Tennessee, Arkansas and Red Rivers. From the 7th to the 30th of April, and thereafter to the 5th of May, 1927, the succession of cyclonic storm areas of the Alberta, North Pacific,

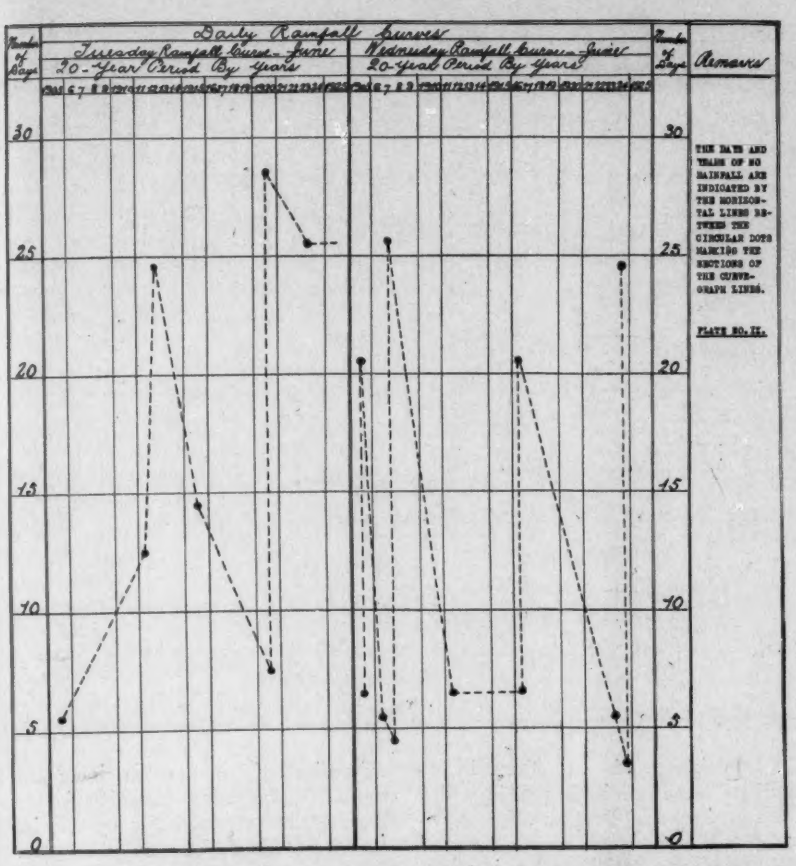

Plate No. IX—Observations made by automatic self-recording raingage and checked with a direct-measurement non-recording raingage. Both U. S. Weather Bureau standard instruments located on the roof of the station building, New York City, 394 feet above sea-level. The circular dots (●) in the rainfall curves mark the day and year of measured and recorded precipitation. The curve-graph lines are formed on a uniform basis and progress from left to right in regular sequence.

Rocky Mountain and Central Rainfall Types, have passed eastward, without interruption, over the 18 States of the Eastern Rocky Mountain Slope and Middle West, with heavy falls of rain and occasional snow that have produced many serious local floods, and have greatly swollen the principal tributaries to the Mississippi. The advent of these cyclonic areas from the Northwest has been supplemented by persistent LOWS from the Mexican, Colorado and South Pacific Rainfall Types. See Plate No. 1 of Article III of this series, on Rainfall Types.

The major axes of these cyclonic areas have been greatly extended north and south, upon arriving in the Mississippi Valley, thus covering the entire central and upper portions of that region, and carrying the Rain Front far to the East. Under these conditions the occurrence and distribution of rainfall has been such as to concentrate a maximum daily precipitation over the drainage areas of the principal tributaries, and thereby affect a simultaneous maximum flood-run-off-delivery to the Mississippi, from all sources of supply. Under these conditions the Rain Insurance problem presented is overwhelming and in the nature of a "conflagration loss," for which special adjustment is required. The Flood Insurance hazard, under these conditions would be considered an "Act of God" catasrophe, for which existing rates would not apply. However, in both of these risks, the maximum loss must be contemplated and provided for, and not left to the perils of luck and chance judgment. Climatological Loss Experience to the utmost for every locality considering Rain and Flood cover. The risks should be written for the entire Rainfall season, well distributed and all cancellations prohibited. In times of great disaster the give-and-take method of adjustment and settlement can be resorted to with satisfactory and responsive results, as between insurer and insured.

WE HAVE seen that rainfall is one of the most powerful agencies of nature in affecting critically organic life, and in producing changes in the surface of the earth. The tools by which the great work in geologic ages and changes have been effected, has been largely through the influence of the air and the rain it generates. They have been at work from the earliest times of which any geological record has been produced and preserved. Geike says that "it is out of the accumulated chips and dust which the air and the rain have made afterwards hardened into solid rock and upheaved, that the very framework of our continents have been formed."

We have stated that the occurrence and distribution of rainfall are influenced by the progressive velocity of cyclonic and anticyclonic areas. The slower the velocity the greater the amount and spread of the precipitation over any given region, and the more prolonged the southerly drift of heat and moisture-laden winds from the Gulf of Mexico into the cyclonic barometric troughs successively covering the great basin of the Mississippi. That sluggish progressive movement has been noticeable during the month of April, 1927 when the great river broke its levees in many places, causing disastrous floods in bordering States south of St. Louis. From the 7th to the 19th the Lows persisted from the Southwest Rainfall Types, and thereafter to May 5th were joined up with these LOWS from the Northwest Rainfall Types. An anticyclonic condition prevailed from the 19th to the 30th of April, especially after the 25th that caused high-barometer precipitation. From the 25th to the 30th and thence to May 5th there existed a combination of Highs and Lows that forced a greater continuity and spread of precipitation over the drainage areas of the tributaries to the Mississippi. The destructive effect of this continued precipitation over the vital drainage areas supplying storm-water-run-off to the Mississippi has been overwhelmingly demonstrated by the great devastation wrought in the Lower Valley of the Father of Waters. The Mississippi flood may be likened to the great Johnstown flood of May 31st, 1889, in that both found the urgent need of the spillway relief to take off the excess of storm-water and reduce the pressure of the crest and peak-load at every weak point in the stream-line, thereby

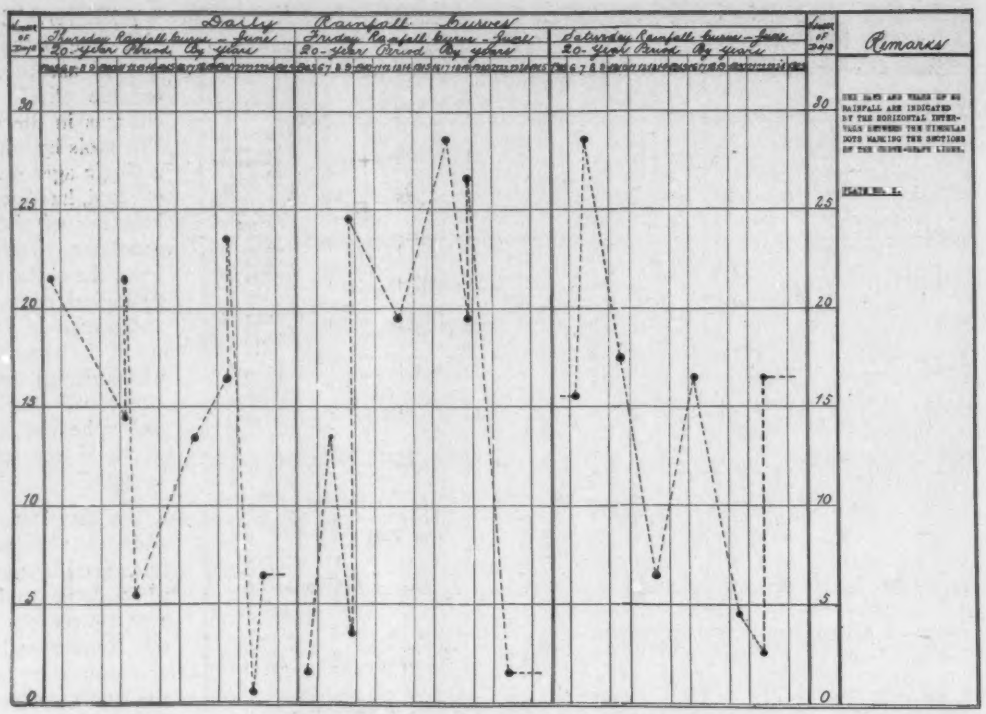

Plate No. X—Observations made by automatic self-recording raingage and checked with a direct-measurement non-recording raingage. Both U. S. weather Bureau standard instruments located on the roof of the station building, New York City, 394 feet above sea-level. The circular dots (●) in the rainfall curves mark the day and year of measured and recorded precipitation. The curve-graph lines are formed on a uniform basis and progress from left to right in regular sequence.

avoiding breaks in the crevasse-lines of defense.

The great spillway of the Panama Canal at Gatun Locks forms Gatun Lake a primal safety valve for the vitals of the Canal, in providing a channel, around the Locks, for the tremendous rainfalls of the Chagres Valley, to reach the sea, through the old course of the Chagres River. The Mississippi has never had a spillway for excess storm-water, and the absence of that vital essential, as a permanent feature of levee-engineering construction, as well as of dam construction, above Johnstown, was the primal cause of that great disaster, and of a similar disaster in the Miami Valley of Ohio in 1913, and of the many disasters in the Lower Mississippi Valley.

IN THE present storm-flood overflows of the Mississippi, the Army Engineers have been forced to open an artificial crevasse or spillway through the Poydras levee, at the big bend below New Orleans, in an effort to save that city from destruction. To provide this artificial crevasse by dynamiting, the Engineers were compelled to ask hundreds of families to vacate their homes and sacrifice their property, valued at about three million dollars in the Poydras Basin, and thus open the temporary safety-valve for the sacrificial innundation. The Governor of Louisiana made an address in behalf of these heroic people, in which he said in part, "The unselfish sacrifice of the people of St. Bernard and Plaquemines Parishes, by involuntarily surrendering their homes and their property, to insure the safety of the half-million people of the great city of New Orleans, from the angry flood-waters of the Mississippi, should ever be considered one of the most patriotic sacrifices the world has ever beheld. Their heroic action will no doubt go down in history, as a living, breathing example of extraordinary devotion to duty, one that unborn generations will hereafter recount with pride, as worthy of the best citizenship this nation has ever produced. Our duty to them should be measured by the duty they have performed toward the people of New Orleans. Patriotism is not a commodity that can be bought and sold, and what they have done in the hour of supreme need, at the sacrifice of hundreds to save hundreds of thousands can only be truly measured in kind, for words and money are fruitless. Let all doubts be resolved in their favor."

Right here, through this great act of sublime unselfishness, is born and coined a new term in the insurance rating field, to be known as the SPILLWAY HAZARD, specially applicable in the writing of both Rain and Flood cover, and not by any means to be ignored in the consideration of some other insurance risks. When this precaution is observed and provided for by the insured, the excessive and prohibitive flood rates should be lowered in the interest of both insurer and insured.

IT SEEMS advisable to caution the reader, that, in a discussion of the graphical illustrations employed in this article, we are considering only the precipitation for the month of JUNE. It is also important to add, that the hours of the daily rainfall under discussion, are limited to the period of seven (7) hours (2 P.M., to 9 P.M.). These are the Critical Rainfall Hazard hours for most classes of Rain Insurance. They are also hours during which excessive rainfalls are most frequent, thereby affecting the problems of Flood Insurance. Specifying the amounts of rainfall, as a "tenth of an inch or more," embraces the lowest limit of what is generally found to be destructive in its effect, or results in a serious hinderance to certain lines of business, amusements, fairs, exhibitions and exercises in athletics.

In other articles to appear on the subject of rainfall occurrence and distribution, we shall give consideration to the remaining hours of the daily periods, and emphasize the hours when precipitation, both as snow and rain is least likely to occur.

DAY OF WEEK	NUMBER OF DEVIATIONS IN RAINFALL CURVE	NUMBER OF SEPARATE DAYS OF RAIN	DAYS OF MONTH ON WHICH RAIN FELL	NUMBER OF DAYS OF NO RAINFALL	AMPLITUDE OF DAILY RAINFALL CURVE	NUMBER OF DAYS IN AMPLITUDE	YEARS OF RAINFALL **	TOTAL YEARS OF RAINFALL	NUMBER OF REPEATED RAINFALL DAYS OF MONTH	NUMBER OF REPEATED RAINFALL YEARS.
SUNDAY	7	8	2,3,5,8,13 18,27,29.	22	24 to 29th	28	1907,1909,1910, 1915,1922, 1923, (1924)	7	NONE	1
MONDAY	4	6	5,10,12,15 17,19.	24	5th to 19th	15	1905,1908,1912 1916,1918,1922	6	NONE	NONE
TUESDAY	7	8	6,7,12,15, 25,26,28, 29.	22	6th to 29th	24	1905,1911,1912, 1915,(1920),1921 1923	7	NONE	1
WEDNESDAY	8	7	4,5,(6) [13] (21) 25,26	23	4th to 26th	23	(1905), 1906,(1907), 1911,(1916), 1923,(1924),	7	3	4
THURSDAY	8	8	1,6,7,14,15 17,(22),24.	22	1st to 24th	24	1905,(1911),1912, 1917,(1920),1922, 1925,	7	1	2
FRIDAY	8	7	(2),4,14,(20) 25,27,29.	23	2d to 29th	28	1905,1907,(1909), 1913,1917,(1919), 1922	7	2	2
SATURDAY	6	7	3,5,7,16, (17)18,29.	23	3d to 29th	27	1906,1907,1910, 1913,1916,1920, (1922)	7	1	1
TOTALS	4 8	5 1	5 1	159	23- - - -185	169	4 8	4 8	7	11
AVERAGES	6.86	7.3	7.3	22.7	3.29 - -26.4	24.1	6.86	6.86	1.75	1.83

Plate No. XI. Correlation of daily rainfall curves in June for the weekly period, Sunday to Saturday, inclusive. Rainfall of a tenth of an inch or more for the hours 2 P. M. to 9 P. M. during twenty years (1905 to 1924 inclusive) at the U. S. Weather Bureau Station of New York City.

**The days of the 9th, 23d and 30th of June had no record of rainfall, from 2 P. M. to 9 P. M. of a tenth of an inch or more, during the 20-year period 1905 to 1924, inclusive. All the other days of the month are represented. In the month of May, the days of no rain under these limitations were the 2d, 5th, 13th, 15th, 19th, 25th and 26th.*

***The Year 1914 had no record of rainfall in June from 2 P. M. to 9 P. M. of a tenth of an inch or more. All other years are represented.*
EXPLANATION OF SYMBOLS—Numbers enclosed in brackets ( ) show one repeat or two occurrences.
Numbers enclosed in square □ show two repeats or three occurrences.

The column headed "Number of Days of No Rainfall", means days on which the rainfall, if any occurred, was less than one tenth of an inch, between the hours of 2 P. M. and 9 P. M.

	DAYS OF WEEK							TOTALS FOR THE				
YEARS	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	YEAR	WEEK	MONTH	PERIOD	.. REMARKS..
1905	0	0	0	0	0	0	0	0	0	0		Friday and Satur-
1906	1	1	0	0	0	1	0	3	3	3		day are the days of
1907	0	2	0	0	1	1	0	4	4	4		greatest rainfall
1908	0	0	0	1	2	0	1	4	4	4		frequency for May,
1909	0	0	0	0	0	1	0	1	1	1		followed next in
1910	0	1	0	0	0	0	1	2	2	2		order by Thursday,
1911	0	0	0	1	0	0	0	1	1	1		Wednesday, Monday,
1912	0	0	1	2	0	0	0	3	3	3		Tuesday and Sunday,
1913	0	0	0	1	1	1	1	4	4	4		the last named
1914	0	1	0	1	0	0	0	2	2	2	5 2	being the day of
1915	0	0	0	1	0	0	1	2	2	2		least rainfall
1916	0	0	1	0	0	0	0	1	1	1		frequency for May.
1917	1	1	1	0	0	1	0	4	4	4		
1918	0	0	1	0	0	2	0	3	3	3		PLATE NO.XII.
1919	0	0	0	0	1	1	3	5	5	5		
1920	0	0	1	0	0	2	1	4	4	4		
1921	0	0	0	1	0	0	0	1	1	1		
1922	0	0	0	0	2	0	0	2	2	2		
1923	0	0	0	0	0	0	1	1	1	1		
1924	1	1	0	0	2	0	1	5	5	5		
TOTALS	3	7	5	8	9	10	10	52	52	52	5 2	
AVERAGES	0.015	0.035	0.025	0.04	0.045	0.05	0.05	2.6	2.6	2.6		

Plate No. XII—Rainfall Diurnals—Rainfall Occurrence—Month of May. Correlation of daily, weekly, monthly, yearly and period totals of times of rainfall for one-tenth of an inch or more, between the hours of 2 P. M. and 9 P. M. during the 20-year period 1905 to 1924 inclusive, at New York City.

Note:—By grouping the individual years, in various periods, a more thorough analysis of the rainfall data is attained, and peculiarities of distribution are disclosed. The hours of 2 P. M., and 9 P. M., are the critical hours of the day for the occurrence of severe local storms. They are generally the hours when rain insurance hazards have a closer relation to business, exhibitions and amusements. Those interested in rain insurance should watch the variations in rainfall frequency, as shown in these tabulations, for the days of the week, and the longer periods of the weeks, months and yearly groupings. This information is valuable to both the insurer and the insured. There is profit in learning how best to employ the data for protection and investment.

YEARS	DAYS OF WEEK							TOTALS FOR THE				REMARKS
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	YEAR	WEEK	MONTH	PERIOD	
1905	0	1	1	2	1	1	0	6	6	6		Wednesday is the
1906	0	0	0	1	0	0	1	2	2	2		day of greatest
1907	1	0	0	2	0	1	1	5	5	5		rainfall frequency
1908	0	1	0	0	0	0	0	1	1	1		for June, followed
1909	1	0	0	0	0	2	0	3	3	3		next in order by
1910	1	0	0	0	0	0	1	2	2	2		Thursday and Friday
1911	0	0	1	1	2	0	0	4	4	4		Sunday, Tuesday and
1912	0	1	1	0	1	0	0	3	3	3		Saturday, terminat-
1913	0	0	0	0	0	1	1	2	2	2		ing with Monday as
1914	0	0	0	0	0	0	0	0	0	0	5 9	the day of least
1915	1	0	1	0	0	0	0	2	2	2		rainfall frequency
1916	0	1	0	2	0	0	1	4	4	4		for June.
1917	0	0	0	0	1	1	0	2	2	2		
1918	0	1	0	0	0	0	0	1	1	1		PLATE XIII.
1919	0	0	0	0	0	2	0	2	2	2		
1920	0	0	2	0	2	0	1	5	5	5		
1921	0	0	1	0	0	0	0	1	1	1		
1922	1	1	0	0	1	1	2	6	6	6		
1923	1	0	1	1	1	0	0	4	4	4		
1924	2	0	0	2	0	0	0	4	4	4		
TOTALS	8	6	8	11	9	9	8	59	59	59	5 9	
AVERAGES	0.04	0.03	0.04	0.055	0.045	0.045	0.04	2.95	2.95	2.95		

Plate No. XIII—Rainfall Diurnals—Rainfall Occurrence—Month of June. Correlation of daily, weekly, monthly, yearly and period totals of times of rainfall for one-tenth of an inch or more, between the hours of 2 P. M. and 9 P. M. during the 20-year period 1905 to 1924 inclusive, at New York City.

Note:—By grouping the individual years, in various periods, a more thorough analysis of the rainfall data is attained, and peculiarities of distribution are disclosed. The hours of 2 P. M., and 9 P. M., are the critical hours of the day for the occurrence of severe local storms. They are generally the hours when rain insurance hazards have a closer relation to business, exhibitions and amusements. Those interested in rain insurance should watch the variations in rainfall frequency, as shown in these tabulations, for the days of the week, and the longer periods of the weeks, months and yearly groupings. This information is valuable to both the insurer and the insured. There is profit in learning how best to employ the data for protection and investment.

FIVE-YEAR PERIODS	DAYS OF WEEK							TOTALS FOR THE				REMARKS.
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	PERIOD	WEEK	MONTH	GROUP	
1905 TO 1909	1	3	0	1	3	3	1	12	12	12		The greatest rainfall frequency occurs in the 3d period, 1915 to 1919, followed next in order by the 4th, 1st and 2d periods. The maximum days are Friday and Saturday. Minimum occurs on Sunday.
1910 TO 1914	0	2	1	5	1	1	2	12	12	12		
1915 TO 1919	1	1	3	1	1	4	4	15	15	15	5 2	
1920 TO 1924	1	1	1	1	4	2	3	13	13	13		
TOTALS	3	7	5	8	9	10	10	52	52	52		
	MONTH OF JUNE.											REMARKS.
1905 TO 1909	2	2	1	5	1	4	2	17	17	17		The greatest rainfall frequency occurs in the 4th period, 1920 to 1924, followed next in order by the 1st, 2d and 3d periods. The maximum day is Wednesday. The minimum day occurs on Monday.
1910 TO 1914	1	1	2	1	3	1	2	11	11	11		
1915 TO 1919	1	2	1	2	1	3	1	11	11	11	5 9	
1920 TO 1924	4	1	4	3	4	1	3	20	20	20		
TOTALS.	8	6	8	11	9	9	8	59	59	59		

Plate No. XIV—Rainfall Diurnals—Rainfall Occurrence—Month of May. Correlation of 5-year periods of daily, weekly, monthly, period and group totals of times of rainfall of one tenth of an inch or more, between the hours of 2 P. M. and 9 P. M. during the 20-year period, 1905 to 1924, inclusive, at New York City.

Note:—By grouping the individual years, in various periods, a more thorough analysis of the rainfall data is attained, and peculiarities of distribution are disclosed. The hours of 2 P. M., and 9 P. M., are the critical hours of the day for the occurrence of severe local storms. They are generally the hours when rain insurance hazards have a closer relation to business, exhibitions and amusements. Those interested in rain insurance should watch the variations in rainfall frequency, as shown in these tabulations, for the days of the week, and the longer periods of the weeks, months and yearly groupings. This information is valuable to both the insurer and the insured. There is profit in learning how best to employ the data for protection and investment.

TEN-YEAR PERIODS	DAYS OF WEEK							TOTALS FOR THE				REMARKS
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	PERIOD	WEEK	MONTH	GROUP	
1905 TO 1914	1	5	1	5	4	4	3	24	24	24		THE MAXIMUM RAINFALL
1915 TO 1924	2	2	4	2	5	5	7	28	28	28	5 2	FREQUENCY OCCURS IN THE 2d PERIOD.
TOTALS	3	7	5	8	9	10	10	52	52	52		MAXIMUM DAYS, FRIDAY AND SATURDAY. MINIMUM, SUNDAY.
					MONTH OF JUNE.							REMARKS.
1905 TO 1914	3	3	3	6	4	5	4	28	28	28		THE MAXIMUM RAINFALL FREQUENCY OCCURS IN THE 2d PERIOD.
1915 TO 1924	5	3	5	5	5	4	4	32	32	32	5 9	MAXIMUM DAY, WEDNESDAY. MINIMUM DAY, MONDAY.
TOTALS	8	6	8	11	9	9	8	59	59	59		

Plate No. XV—Rainfall Diurnals—Rainfall Occurrence—Month of May. Correlation by ten-year periods of daily, weekly, monthly, period and group totals of times of rainfall of one-tenth of an inch or more, between the hours of 2 P. M. and 9 P. M. during the 20-year period, 1905 to 1924, inclusive, at New York City.

Note:—By grouping the individual years, in various periods, a more thorough analysis of the rainfall data is attained, and peculiarities of distribution are disclosed. The hours of 2 P. M., and 9 P. M., are the critical hours of the day for the occurrence of severe local storms. They are generally the hours when rain insurance hazards have a closer relation to business, exhibitions and amusements. Those interested in rain insurance should watch the variations in rainfall frequency, as shown in these tabulations, for the days of the week, and the longer periods of the weeks, months and yearly groupings. This information is valuable to both the insurer and the insured. There is profit in learning how best to employ the data for protection and investment.

A discussion of precipitation, in the form of snow only, will receive attention in due time. Snow insurance has been written, both in favor of and against its occurrence. As a protective cover for winter grains, all farmers, especially those of the Middle West, appreciate the high value of such a preserving blanket, especially during the thaws and freezes, and the occurrence of the Chinooks of the Northern Plateau, when the tender roots of the grain plants are subjected to exposure and dangerous changes in temperature and in humidity. Thus the Snow Line introduces a very important problem in the underwriting of Crop Insurance.

In the maintenance of certain profitable winter amusements, recreations and sports, the presence of snow, in serviceable quantities, is of indispensable value. Here again the Snow Line is of critical importance, both financially and socially. It partakes of a degree of Social Insurance. In Crop Insurance, we must not only know the characteristic plant life and its insect enemies, but we must know its favorite soil and its sensibility to changes in temperature and humidity. By these requirements we therefore bring in the botanical line, the biological line, the insect line, the soil line, the heat line, the frost line, the drought line, and the rainfall line. All of these lines are worthy of most careful investigation, in seeking a trustworthy basis on which to formulate rates, applicable to different crops, in varying localities.

THIS brief diversion to other classes of insurance is intended to show their relation, in some degree, to rain cover. Perhaps the Rainfall Hazard may be considered the most comprehensive of all classes of weather insurance. In some respects the most difficult of all for successful rating, because of its peculiarities in occurrence and distribution. We have found that the occurrence of rainfall depends upon a multitude of atmospheric conditions, not the least of which are certain gases, certain heat conditions, certain rate of evaporation, certain humidity percentage, certain mixture of superimposed layers of air, and above all, for volume condensation, of the presence of a sufficiency of dust particles.

When all of the usual outward signs are present and rain drops fail to reach the earth, who shall say which one or more of the above conditions are absent or in some measure deficient? In the sudden ending or sudden beginning of rain, who shall call the roll and keenly analyze the actual absences and deficiencies? These problems must be solved in the physical laboratory, by the most patient and prolonged effort, in the simulation of atmospheric conditions, the assimilation of constituent elements, and the mathematical treatment of the involved problems of thermodynamics.

Our analysis in these articles must follow along empirical lines for the sake of practical results demanded and the immediate application of the information furnished to the solution of daily problems in agriculture and insurance. The advance of the higher and more abstruse needs, in the field of the pure science of meteorology, must be realized by the mathematical development of the theoretical physics of the atmosphere. As these results become available they should be applied to the improvement of the empirical results, within the bounds of daily commercial needs.

Reviewing the weekly group of daily rainfall curves for June, it will be found interesting and useful to call attention to the salient and significant features, and compare the same with those brought to light, in a preceding article, for the month of May. The least complicated structure appears on Monday, which in May was found on Sunday. The most complex appears on Wednesday, which in May developed on Thursday. Monday exhibits the least amplitude, with a range of 15 days, and Sunday and Friday have the greatest amplitude, with a range of 28 days. In May these days were, the minimum on Sunday and the maximum on Thursday. Comparing the days of the week, on the basis of the rainfall spread, in June, they follow, in the order from the lowest to the highest, as Monday, Wednesday, Friday and Saturday, Sunday, Tuesday and Thursday. In May the order was,

The A. M. Rainfall of 1914 for June at New York City

	DATES OF RAIN	TIMES OF OCCURRENCE MORNING	AMOUNT INCHES	DATES OF NO RAIN	DAYS OF NO RAIN
	June 4th	6 A.M. to Noon	Frequent showers 0.39 inch.	1st to 3rd, inclusive 5th to 7th, inclusive	3 3
	June 8th	7:20 A.M. to 8:05 A.M.	Trace	9th to 14th, inclusive	6
	June 15th	1:45 A.M. to 8:15 A.M.	Steady Rain 0.41 inch.		
	June 16th	Midnight to 1:10 A.M. 4:00 A.M. to 5:16 A.M.	Trace 0.02 inch.	17th and 18th	2
	June 19th	7:30 A.M. to 8:07 A.M. 9:44 A.M. to 10:05 A.M.	Trace Trace	20th and 21st	2
	June 22nd	3:30 A.M. to 7:05 A.M. 7:56 A.M. to 9:50 A.M.	0.05 inch Trace		
	June 23rd	7:43 A.M. to 8:10 A.M.	Trace	24th	1
	June 25th	Midnight to 1:00 A.M.	0.02 inch		
	June 27th	7:23 A.M. to 7:29 A.M. 10:34 A.M. to 10:44 A.M. Midnight to 7:20 A.M.	Trace Trace Trace	26th	1
	June 28th	8:10 A.M. to 8:35 A.M.	0.01 inch		
	June 29th	Midnight to 2:30 A.M.	0.07 inch	30th	1
TOTALS	11-Dates 19-Day Intervals	16 Occurrences 31 Hours and 41 Minutes	0.97 inch. 9-Traces	19-Day Intervals	19
AVERAGES	8-Periods 2.375	2 Hours and 1 Minute.	0.139 inch.	8-Periods	2.375

The P. M. Rainfall of 1914 for June at New York City

	DATES OF RAIN	TIMES OF OCCURRENCE AFTERNOON	AMOUNT INCHES	DATES OF NO RAIN	DAYS OF NO RAIN.
		Noon to 4:25 P.M.	0.07 inch	1st to 3rd, inclusive	3
		6:20 P.M. to 6:42 P.M.	Trace		
	June 4th	7:05 P.M. to 8:35 P.M.	0.02 inch	5th and 6th	2
	June 7th	10:22 P.M. to 11:55 P.M.	0.11 inch.		
		2:16 P.M. to 3:00 P.M.	0.06 inch.		
	June 8th	4:19 P.M. to 4:45 P.M.	Trace	9th to 14th, inclusive	6
	June 15th	10:10 P.M. to Midnight	0.11 inch	16th to 18th, inclusive	3
		2:13 P.M. to 3:05 P.M.	Trace		
		3:32 P.M. to 4:40 P.M.	Trace		
	June 19th	9:45 P.M. to 11:40 P.M.	0.12 inch	20th to 22d, inclusive	3
	June 23rd	7:30 P.M. to 7:37 P.M.	Trace		
	June 24th	11:05 P.M. to Midnight	0.26 inch	25th	1
		2:40 P.M. to 2:57 P.M.	0.08 inch		
		7:30 P.M. to 7:45 P.M.	Trace		
		8:06 P.M. to 8:15 P.M.	Trace		
	June 27th	9:25 P.M. to Midnight	Trace		
		3:35 P.M. to 6:40 P.M.	0.01 inch.		
	June 28th	7:25 P.M. to Midnight.	0.01 inch.	29th and 30th	2
TOTALS	9 Dates 20-Day Intervals	18 Occurrences 21 Hours and 38 Minutes	0.86 inch. 8-Traces	20-Day Intervals	20
AVERAGES	7-Periods 2.857	1 Hour and 14 Minutes.	0.086 inch	7-Periods	2.857

Sunday, Tuesday, Friday, Monday, Saturday, Wednesday, and Thursday. A change in the order of sequence is not apparent from a cursory examination.

Considering years of rainfall frequency by days, we find in June, the following results, in an ascending scale; Monday, Sunday, Tuesday, Wednesday, Thursday, Friday and Saturday. In fact, all days are equal save Monday, with a departure of only one from the average of seven, giving a general average of 6.86 years per day. A remarkable coincidence, between the number of days in a week (seven) and the number of rainfall years on six days of the week being seven, in exact agreement, the remaining day of the week, Monday, recording six years. In May the variations were more pronounced, although the general average at 6.1 is in rather close agreement.

Compared on the basis of the number of days without rain, from highest to lowest, the following order prevails in June: Monday, Wednesday, Friday, Saturday, Sunday, Tuesday, and Thursday. In May the order was Sunday, Tuesday, Monday, Friday, Wednesday, Saturday and Thursday.

AN INTERESTING result to keep in mind is, that based on a record of twenty years, there has been an average number of six rainfall years per day, throughout May and June, and that in June the maximum number never exceeded seven, and the minimum never fell below six; remembering that these results are for the critical seven rainfall hours (2 P.M. to 9 P.M.) of a seven-day week, and a seven-year period per day for six-sevenths of the week, covering the destructive amount of rainfall, of a tenth of an inch and above. When the atmospheric conditions of condensation favor a deposit of a tenth of an inch of water and above, the Rainfall Hazard Line is attained, with the probability of its rising rather than falling, before the termination of the Rain Spread in that climatological event.

Comparing the years of the 20-year period, for the order of frequency in rainfall occurrence, we find the result, in the ascending scale, as follows:—Starting with 1914 at zero, the sequence is 1908, 1918, 1919, 1921, 1906, 1909, 1910, 1911, 1912, 1913, 1915, 1917, 1924, 1916, 1920, 1907, 1923, 1905 and 1922. The year 1905 in June is one of the two years exhibiting the maximum frequency of occurrence, while in May this year reported no Rainfall Hazard occurrence whatever.

The Rainfall Hazard Line of a tenth of an inch and above, represented on the same day, during the month of June, began the repetition with the 2nd on Friday, and followed with the double occurrence, on the 6th Wednesday on the 17th Saturday, the 20th Friday, the 21st, Wednesday and the 22nd, Thursday. The one triple occurrence took place on the 7th Wednesday. There were no repetitions on Sunday, Monday and

Tuesday. The maximum number of repetitions occurred on Wednesday. In May double occurrence days took place on Sunday, Monday and Friday, and the triple occurrence on Saturday. With respect to the years the double occurrences took place in the month of June, as follows: 1905, 1907, 1909, 1911, 1916, 1919, 1920, 1922 and 1924. There was no year with a triple occurrence, which in May took place in 1919 on Saturday.

We have already shown that the year 1914, in June, had no Daily Rainfall Hazard (tenth of an inch and above) during the seven Daily Critical Rainfall Hazard hours of 2 P. M., to 9 P. M. Therefore it becomes necessary and advisable to review the entire rainfall record, both A.M., and P.M., for this year in the month of June.

(*See tables on preceding page*)

A survey of the above tabulations gives the following results: The total rainfall for June 1914 is 1.83 inches, 0.97 of which fell during the forenoon and 0.86 in the afternoon. While the occurrences of rainfall in the forenoon were two less than in the afternoon, the amount of the former was 0.11 of an inch greater. The traces were nearly even, the forenoon being greater by one. It was the steady precipitation of the 4th and 15th that gave the increase to the forenoon total. During the entire month the two divisions of the day were in remarkably close correspondence, the net difference in the amounts, being only eleven hundredths of an inch, in favor of the forenoon, although the latter had ten hours and three minutes more of precipitation.

The absence of the Rainfall Hazard Line in June, 1914, for the seven Critical Hazard hours of the afternoon (2 P.M. to 9 P.M.,) was due to the lack of atmospheric conditions capable of producing Volume Condensation. The average temperature, humidity and rainfall were below the normal of these elements for June. There was an unusually cold nine-day period from the 15th to the 23rd, followed by a high warm wave on the 25th, and then another cool wave on the last three days. These abrupt and varying atmospheric conditions, gave rise to abnormally frequent but small condensations, entirely free from the presence of the insurance hazard.

RETURNING to the problem of the influence of the progressive velocity of Cyclonic (LOWS) and Anticyclonic (HIGHS) areas on the development of the Rainfall Types, attention is invited to the valuable analysis presented in Plates XVI and XVII, forming part of the illustrations of this article. These tabulations should be very carefully studied in connection with the cartographical display of Rainfall Type Tracks shown in Plate I of Article III. The following significant deductions from these Plates will point the way for a successful examination of them:

1. Lows that pass eastward from the Rocky Mountain Type are very tenacious and persistent, producing general precipitation with abnormally low temperatures.

2. A sharp dip in the isotherms over the Western Plateaus, is a strong indication of the breaking away of the passing LOW, from the main belt of low pressure, as the former moves eastward along the path of the Central Type and increases the volume of condensation in the great Mississippi Basin.

3. The passage eastward of a LOW from the Alberta and Lakes Types will rapidly develop an extensive Rainfall Spread if the temperature is high, with strong southerly winds, in the West Gulf States.

4. With a warm HIGH in the Southeast and an approaching cold HIGH in the Northwest, storm development and precipitation will be general in the Southwest.

5. Sluggish LOWS from the Colorado, Rocky Mountain, North Pacific and Central Types are peculiar to the Spring months, giving rise to a wide Rain Front and an extended Rain Spread in passing over the Mississippi Basin.

6. A fast moving LOW from the Southwest and Western Types is usually followed by a secondary LOW that develops to the eastward and south of the place of inception of the former, and extends the Rain Spread over the Gulf and South Atlantic States.

7. When a LOW appears in the Southwest and is forced to the left of the Normal Type Path, a secondary LOW will immediately begin to develop with a sure and decided Rain Front that eventually forms an extensive Rain Spread that is projected to the eastward.

8. The formation of a pronounced Bermuda HIGH, ranging well above 30.22 and persisting in that location, will increase the temperature and humidity of the Atlantic Coast States, intensify a LOW in the Central Type Path, encourage the development of severe local storms, and greatly extend the Rain Spread eastward.

9. Storm LOWS developing from the Northwest Type Paths diminish in intensity in passing over the Rocky Mountains, and enter the Mississippi Basin with reduced progressive velocity. The energy of these LOWS are quickly restored if the circulation northward from the Gulf is not interfered with by an opposing LOW with stronger inflow.

10. When a LOW from the Northwest Type Paths shows a deep depression over the Western Plateaus and Middle Rocky Mountain Region, a barometric trough, with major axis SW. and NE. will form in 24 hours, having the main storm center in the southern end.

11. Cyclonic LOWS with barometric troughs are generally of two types, the narrow and the wide. The storm centers form in the extreme northern and southern ends, and rarely if ever in the middle of the trough, where the minor axis is the shortest. The wide troughs give rise to broad Rain Fronts and deep Rain Spreads.

The principal insurance lessons brought to light in this Article gather about the sources of Rain Fronts and Rain Spreads.

1. That rainfall depends upon the constituent and adventitous elements of the atmosphere.

2. That atmospheric precipitation received the earliest consideration from the ancients. The first measurements of rainfall appear to have been made in Palestine in the first century A.D., and the effect on crops observed.

3. The ancients were not slow to observe the tremendous physical effect of rainfall in changing the surface of the earth, in the formation of rivers and in the production of destructive floods. The bible makes repeated reference to the powerful effects of rainfall and to its beneficial results.

4. That precipitation has wrought the greatest geological changes in the history of our planet.

5. That precipitation has divided the planet into land and water areas and maintained the proportions first established, subject to natural adjustments.

6. That dust particles in the atmosphere promote the development of precipitation.

(Continued on page 30)

CYCLONIC RAINFALL TYPE PATHS.	MONTHS AND 24-HOUR MOVEMENTS IN MILES, WITH NUMBER OF OBSERVATIONS AND NUMBER OF LOWS																														YEARLY SUMMARY		
	January			February			March			April			May			June			July			August			September			October			November			December			Average	Total	Total
	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles.	Obs.	Lows	Miles	Obs.	Lows
The Alberta Type) The Aleutian Type) The Lakes Type)	730	531	98	679	404	65	664	475	76	655	521	72	607	395	60	490	466	70	528	568	100	480	575	80	575	563	87	614	513	88	683	529	85	737	508	91	608.7	6,082	980
The North Pacific Type	755	365	53	709	302	48	699	322	44	618	285	35	674	219	27	432	197	16	500	116	14	450	100	12	585	189	23	640	263	28	649	375	48	781	390	53	624.0	3,101	386
The Rocky Mountain Type	699	49	8	755	31	5	715	55	5	525	55	11	450	115	15	467	141	16	545	70	11	613	128	18	609	85	13	536	60	10	640	59	9	870	28	5	648.0	826	127
The Central Type	799	35	10	764	25	14	706	51	15	568	69	19	585	90	21	529	105	25	465	72	20	435	94	20	503	75	15	554	35	8	606	111	20	587	83	29	641.4	914	188
The South Pacific Type	749	161	20	703	178	21	640	102	24	587	171	18	496	209	29	520	56	8	529	82	17	547	76	7	475	79	8	525	116	16	617	116	15	654	147	16	597.4	1,617	183
The Colorado Type) The Mexican Type)	725	155	20	657	174	31	654	212	29	499	187	28	524	175	30	494	154	25	563	124	19	508	145	20	611	94	14	563	200	36	654	147	23	677	167	23	592.9	1,934	319
The Texas Type) TheCentral American Type)	749	280	32	700	150	32	742	136	28	616	99	20	511	98	16	579	48	9	480	27	5	373	33	5	380	36	7	591	104	16	624	139	21	757	246	38	654.2	1,338	242
The West Gulf Type) The East Gulf Type) The West Indian Type)	772	39	6	678	30	10	633	23	9	502	23	7	441	22	4	598	21	4	186	9	2	680	5	1	486	58	8	600	35	8	608	49	8	740	19	4	580.7	329	73
The South Atlantic Type The Gulf-Stream Type	768	31	6	561	18	4	577	22	6	481	24	12	548	29	7	399	23	6	396	12	2	700	5	3	686	8	4	514	40	10	525	73	17	656	24	17	564.0	300	97
TOTALS	6,744	1,871	267	6,180	1,408	230	6,080	1,448	247	4,758	1,448	216	4,454	1,331	204	4,232	1,175	177	4,167	1,047	211	4,740	1,161	174	4,780	1,189	179	4,978	1,369	217	5,606	1,600	244	6,368	1,565	271	5,218.0	16,229	2,257
AVERAGES	750.4	174.6	29.7	686.6	156.8	25.6	668.9	160.9	27.4	528.8	160.8	24.0	492.9	147.8	22.7	474.4	130.5	19.7	463.0	116.3	23.4	526.7	129.0	19.3	531.1	132.1	19.9	552.9	152.1	24.1	622.9	177.8	27.1	707.6	172.9	30.1	580.4	1,804.3	250.8

PLATE No. XVI.—Rainfall Diurnals in Relation to the Progressive Velocity of Cyclonic (Lows) Areas Crossing the United States from West to East Following Well Established Type Paths Correlation of Lows to Rainfall Type Paths in the Western Sections of the United States for the 20-Year Period, 1892 to 1912 Inclusive. Data Taken from U. S. Weather Bureau Records.

REMARKS - PLATE XVI (continued)

Maximum Miles in January 738 and 737 in December.
Minimum Miles 480. Max. Lows 100 in July; minimum 60 in May.

Max.Miles,706 in January.Minimum 432 in June.Max.Lows 53 in Jan.& Dec.Min., 12 in August.
Max.Miles,670 in Dec.,Min.,450 in May.Max.Lows 18 in Aug. Min, 5 in Dec.
Max.Miles,798 in Jan. Min, 468 in July. Max. Lows,23 in June. Min. 6 in Oct.
Max.Miles,749 in Jan. Min.,406 in May. Max. Lows,25 in May. Min.,7 in July and August.

Max.Miles,725 in Jan. Min.,484 in June. Max Lows, 39 in March. Min., 14 in Sept.

Max.Miles,757 in Dec. Min.,373 in Aug. Max. Lows, 53 in December.Min.,6 in July and Aug.

Max.Miles,772 in Jan. Min., 198 in July. Max. Lows., 10 in Feb. Min. 1 in Aug.

Max.Miles,768 in Jan. Min.,396 in July. Max. Lows,17 in Nov. Min., 3 in July & Aug.

ANTICYCLONIC RAINFALL TYPE PATHS.	MONTHS AND 24-HOUR MOVEMENTS IN MILES WITH NUMBER OF OBSERVATIONS AND NUMBER OF HIGHS																														YEARLY SUMMARY		
	JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			Average	Total	Total
	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles.	Obs.	Highs	Miles	Obs.	Highs
The Alberta Type) The Aleutian Type)	601	774	116	590	755	99	661	937	117	551	457	65	489	589	69	501	360	40	511	468	68	504	647	63	558	808	73	585	639	62	570	862	83	560	977	98	549.6	8,884	947
The North Pacific Type	669	119	17	648	162	17	607	177	18	543	403	34	603	348	28	480	495	34	482	367	28	498	440	39	561	569	44	547	704	58	558	536	43	564	220	23	542.5	4,530	382
The Rocky Mountain Type) The Plateau Type)	699	201	36	695	152	26	592	189	19	576	156	21	575	104	14	490	185	19	469	220	26	471	203	19	566	161	16	565	269	26	503	197	23	600	180	28	559.2	2,197	278
The Hudson Bay Type) The Lakes Type)	559	19	6	503	63	12	541	41	10	445	62	13	410	86	10	424	79	11	379	118	16	407	123	16	381	91	12	369	103	12	560	24	6	445	62	10	480.6	868	142
The South Pacific Type	689	99	12	617	87	10	582	147	16	542	480	34	497	191	11	472	203	18	509	79	7	456	90	4	535	285	21	518	256	20	498	221	19	629	210	25	581.6	2,254	188
TOTALS.	3,140	1,212	190	2,853	1,219	164	2,910	1,461	179	2,667	1,498	167	2,574	1,318	140	2,367	1,326	117	2,349	1,236	139	2,336	1,503	141	2,596	1,914	165	2,574	1,961	178	2,689	1,841	173	2,792	1,549	194	2,652.5	18,164	1,997
AVERAGES	628.0	242.4	38.0	570.6	243.8	32.8	582.0	292.2	35.8	533.4	299.6	33.4	514.8	263.6	28.0	473.4	265.2	23.4	469.8	247.2	27.8	467.6	300.6	28.2	519.0	382.8	33.0	514.8	392.2	35.6	537.8	272.2	34.6	558.4	329.8	26.8	530.5	3,632.8	399.4

PLATE No. XVII.—Rainfall Diurnals in Relation to the Progressive Velocity of Anticyclonic (Highs) Areas Crossing the United States from West to East, Following the Well Established Type Paths. Correlation of Highs to Rainfall Type Paths in the Western Sections of the United States for the 20-Year Period 1892 to 1912. Data Taken from the U. S. Weather Bureau Records.

REMARKS - PLATE XVII (continued)

Maximum Miles,601,January. Minimum,489 miles, May.
Maximum Highs,116,January.Minimum Highs,40 in June.

Maximum Miles,559,January. Minimum,480 Miles,June.
Maximum Highs,68,October. Minimum Highs,17 in January and February.

Maximum Miles,699,January. Minimum 469 miles,July.
Maximum Highs,36,January. Minimum Highs,14 in May.

Maximum Miles,560,November. Minimum 369 miles in October.
Maximum Highs,12 in May. Minimum Highs, 5 in November.
Maximum Miles,628,January. Minimum 458 miles in August.
Maximum Highs,25 in December. Minimum Highs, 4 in August.

Service of Fire Insurance

(*Continued from page 7*)

mitted in the next quarter-century and half-century.

The reaction of the public to fire prevention activities, the annual observance of Fire Prevention Week, the success of the Fire Waste Contest sponsored by the Chamber of Commerce of the United States—all these and many other signs show that fire prevention will increasingly be looked upon as a major function of the business.

AMERICAN business is going to require more and more of fire insurance service. Not only will fire coverage increase tremendously as to its ratio to insurable values as well as quantitatively, but also there will be constantly increasing demands for the other lines, including use and occupancy, rent, rental value, leasehold, profits and commissions, automobile, sprinkler leakage, tornado and windstorm, parcel post, tourist floater, hail, explosion, earthquake, registered mail and others.

As business becomes increasingly complex and extensive, these lines become more important. For instance, the importance of parcel post insurance is indicated by the fact that the "dead parcel offices" receive over eight hundred thousand parcels a year, while the maximum protection furnished by the government is but one hundred dollars per package. High prices and rapid transportation make for small stocks and quick turnovers in mercantile establishments. Highly perfected machinery enables manufacturers to increase their output while decreasing amount of space and equipment. The possible loss of net profits and fixed expenses may actually be greater than the possible property loss by fire. As a result, business interruption indemnity will become daily a greater factor in fire insurance service.

In every development looking toward prevention of loss and stabilization of business, fire insurance service will be required. The companies must be in the vanguard in extending the use of sprinkler equipment, developing automatic alarm systems, gathering statistics and formulating conclusions that will enable them to guard against possible catastrophes, and so on through an extensive list of improvements, in the public interest. Much has been done, much remains to be done in informing the public as to the policy contract and in improving, simplifying and standardizing policies and forms. In the forty years since New York standardized a fire policy, following the pioneer step of Massachusetts seventeen years earlier, thirty additional states have adopted a standard form, the New York form generally being followed. Our future progress in such matters will doubtless be much faster.

Many major problems await solution, among them prevention of and indemnity for forest fires, and reduction of the tremendous farm fire loss now estimated at one hundred and fifty million dollars annually, not to mention some of the less obvious.

THE present tasks and achievements of business will be dwarfed by those of the future, and in all of its enterprises business will depend upon the stabilizing influence of fire insurance service. The demands upon fire insurance companies in future years, the responsibilities that will be imposed upon them, stagger the imagination. We were impressed recently with this headline in one of the insurance journals, "Can Locality Disasters Be Insured Against?" It had reference particularly to the recent Southern hurricane. It suggests to any thinking mind that inevitably a far greater portion than at present of those losses which even future scientific forethought and ingenuity cannot ward off, due to wind, water and earthquake, will be indemnified by the insurance companies.

Here in the annual meeting of the Chamber of Commerce of the United States, we, as insurance purchasers and providers — because in this insurance session both participate—can not only congratulate ourselves on an increasingly comprehensive relationship, but we can also view with satisfaction the prospects for the future. If the needs of the business justify higher rates, the purchaser should remind himself of the remarkable record of fire insurance companies in providing indemnity today at less than prewar cost. And, he can also examine his own industry and determine whether all has been done that should be done to eliminate causes of fire, physical and otherwise. Because, until the honest and careful buyer interests himself in the cost to him of insuring the careless and dishonest, progress along this line will be retarded.

The record of fire insurance is one of which American business can well be proud. The loss to the public through failures, the lack of interest in fire prevention and other service features by individual companies in time past is completely offset by the record as a whole in meeting conflagration emergencies and by present day interest in the public welfare. Furthermore, the weaknesses that have developed are in the main less serious than has been true in other lines of endeavor.

Notwithstanding legislative handicaps of many years standing American insurance now follows the flag to the far corners of the earth. With the co-operation of other business, fire insurance can and will meet the needs of commerce to the mutual advantage of all branches of industry.

The institution of fire insurance slowly built up in two centuries and a half of usefulness, faces growth and responsibility that will make its past seem to have been a period of immaturity and apprenticeship when contrasted with the gigantic achievement of its future. It should and I believe will meet the opportunity squarely and effectively.

Wins Trip Abroad

AT THE banquet given by the home office staff for those attending the three-day meeting of Kemper Insurance fieldmen, at the Edgewater Beach Hotel, Chicago, May 9-11, Mr. Wayne B. Morrell of Newark, N. J., was announced as winner of the trip to Europe for the best record for the three years 1924-5-6.

President James S. Kemper of the Lumbermen's Mutual Casualty Company and the National Retailers' Mutual Insurance Company, in naming him, paid high tribute to Mr. Morrell's nine-year record of service to the clients of these and the other organizations under Kemper management.

"What's Ahead For Insurance"

By JAMES S. KEMPER,

President, Lumbermen's Mutual Casualty Company, Chicago

From Address at the meeting of the Chamber of Commerce of the United States, Washington, D. C., May 5, 1927.

THE institution of insurance reflects in its development the progress of other business. When sales are good, and prices satisfactory, the insurance volume keeps pace. When business is retarded the insurance volume immediately recedes.

There is too the important factor of individual interest in preventing loss. On the upgrade of the business cycle the property owner making substantial profits views with concern the possibility of interruption of business through loss by fire or other disaster. With trade conditions unfavorable there is less incentive to guard against catastrophe so that insurance results are affected adversely not only in volume of business done but in percentage of cost.

The experience of insurance companies further reflects general business conditions through the investment situation. In late years in particular many companies have had to look to their so-called banking or investment division for their earnings.

You will realize, therefore, that a composite of the cross section of business conditions that you are having this morning will represent very nearly the results insurance will achieve this coming year.

Probably the outstanding feature of present day insurance is the increasing interest of insurance companies in policyholder education. In the life field tremendous strides have been made in health conservation and in increasing the span of life. Statistics recently compiled by one company showed an increased longevity of approximately nine years in the last fifteen years. In fire and casualty fields there has been a similar development through exhaustive studies and constant attention by company engineers striving to reduce loss costs and conserve man power and property.

Two resolutions from our Insurance Group Meeting will, I hope, come before you today. One deals with a desirable adjustment of Federal Public Health Service. The other, if generally followed, would enable insurance to meet the needs of commerce without some of the handicaps now imposed.

LIFE companies now protect human values to the extent of eighty-five billion dollars. Fire companies protect property of a value of two hundred billion dollars. Casualty companies protect millions of workmen and general business in many other lines. The development of new kinds of insurance to meet the requirements of business has brought the companies increased volume with increased opportunity for service. The automobile field has had a most remarkable growth. Installment buying, which for good or ill is with us, has brought increased demands for insurance.

Chamber members are increasingly taking advantage of the Chamber's Insurance Department services. The constant and heavy flow of inquiries over the Manager's desk indicates the value of the service to the underlying membership. This is further evidenced by the increasing insurance buyer interest in and attendance at our Insurance Group Meetings.

There has also been a most active interest on the part of local chambers and trade associations in the loss prevention aspects of insurance. You business men, delegates to this annual meeting of the National Chamber, can assist in the great work of life and property conservation by urging your local chambers to actively support the Chamber's Insurance Department committee. Every chamber of commerce and trade association should have insurance and conservation committees.

Speaking generally, insurance approaches the coming year with confidence as to volume of business and larger opportunity for service. With a stable investment situation, the year should produce satisfactory results.

Farm Insurance

(*Continued from page* 11)

ORGANIZED rural fire protection has already been established in a number of communities and this offers another possibility to farmers' mutuals for initiative or for co-operation with other organizations in improving the farm fire loss situation. This is however a topic by itself and cannot well be covered in this article.

While most of these activities will involve expense this should not deter a company organized to deal with losses from attacking this problem in an effective, scientific way. To the extent that evils are prevented the need for a cure is obviated, and in the long run the farmer is usually the cheaper. Most farmers' mutuals could well afford to double their expenses if by so doing they reduced their losses by a quarter of what they are. The experience of some mutuals indicates that a very moderate but wise expenditure for prevention may reduce losses by one-half and even by three-fourths.

Why should not these mutuals all attack their farm loss problem at its source both independently and in co-operation with other interests? It is peculiarly the business of these companies. By helping their members in this manner the companies also help themselves. Nothing is more disastrous to such an organization than a bad loss record. Human happiness, human life, needed property, and the success of the companies are at stake.

Rainfall Hazard

(*Continued from page 27*)

7. That the presence of certain gases in the atmosphere tend to hasten condensation, especially Volume Condensation.

8. That the presence of electrons in the atmosphere may have influence in hastening precipitation.

9. That when precipitation begins or ceases the cause or causes are not apparent, except through the most thorough research work.

10. That the Spillway Hazard is of prime importance in the writing of Flood cover.

11. That the Rain Front and the Rain Spread are concomitants of the formation and movements of HIGHS and LOWS.

12. That the Daily Rainfall Hazard is a function and permanent feature of the P. M. precipitation.

13. That the Daily Critical-Rainfall-Hazard hours are generally the seven hours from 2 P.M., to 9 P.M.

14. That the progressive velocity of HIGHS and LOWS has a highly important relation to Rain Fronts and Rain Spreads.

15. That barometric troughs tend to increase the Rain Fronts and the Rain Spreads in the great Mississippi Basin.

NOTE:—The following correction is necessary in reading the values of Plate II of Article IV, Section One on Rainfall Diurnals. In all instances of double occurrences the totals must be increased by one, inasmuch as they have been summed as single occurrences.

Mutual Anniversary

(*Continued from page* 12)

The company has prospered, grown in size, importance and standing, in financial resources, and has not in any year of its existence failed to realize a handsome profit for its policy holders, in whose interests it is primarily conducted, as a mutual proposition in fact as well as name.

The uninterrupted success and Mr. Vernon's personal qualities have always permitted him the association, business and friendly support and co-operation of strong people of character and ideals in both the original and later Board of Directors. The company commands the respect and confidence of over eleven thousand policy holders, the public and the better financial institutions, who freely accept its contracts for themselves and as collateral security for loans.

Extremely conservative business policies have always been maintained without attempting to expand for volume or size at the expense of quality; and having a first and last aim to deal fairly with every deserving claimant in regarding every business transaction as a moral, as well as a legal responsibility.

Representatives are selected with care and are usually the leading firms in the community. Of one hundred and forty active agencies now maintained, three survive from April 1877; one from 1884; three are descendants of 1877 agents, and 52 with firm changes are continuous for over 35 years.

It is unusual where a business existence of 50 years has been successfully maintained in the hands of the individual responsible for its very existence.

Creative Spirit

(*Continued from page 15*)

as well as by the pressure of emulation.

Inter-company conferences when measured in terms of their wholesome contributions to the efficiency of business administration convince us that there is no room for skepticism concerning their value. Such conferences can help every representative by silently revealing to him the imperfections and weaknesses of his line of reasoning and analysis. Men see their problems from the observatory of their own peculiar habits of mind, their individual tastes and personal prejudices. Records and systems often gain favor because of long association and are seldom subjected to unsparing critical analysis. Why not test your theories and conclusions often. Inter-company conferences are impartial and subjects are not discussed in light of printed material but as they appear to those on the spot who have been associated with and have practical experience in the particular field. The friendly co-operation which this interchange of ideas has in the course of the last few years very happily fostered and developed is perhaps the outstanding achievement of 20th century business.

We must not be deluded into thinking that this medium is immune from imperfections. We wish to know its weaknesses and guard against them. There are always a few who are extremely critical whose criticism is not constructive and to them we suggest retrospection and self examination wherein they ask themselves whether they have contributed something more than their presence to insure a thorough analysis of the problems. However, we recognize that some men must overcome strong resistances before they can begin to learn certain things.

ANNUAL conferences in certain fields are sufficient but the general feeling seems to be that to be productive more frequent gatherings of men interested in highly specialized departments are desirable. An annual conference that will bring together the smaller conferences whose representatives have met at shorter intervals would seem to be a silent demand.

The creative spirit is simply the alert mind at work on the problems before it and it can be and is inspired and assisted by suggestions, ideas and the thoughts gained by the inter-change of ideas through the medium of well ordered and purposeful inter-company conferences.

Just a word of caution. There is the constant need of re-examining the reasons for these meetings. It occasionally happens that those at the head lose sight of the purpose for which they were intended. Do not hold such conferences unless they promise to be productive. Strive to eliminate an excess of theoretical discussions and dwell upon the practical side of your problems.

Inter-company conferences should be great lighthouses which if properly conducted will illumine some of our darkest problems and correct many fallacies of reasoning.

When once it will be generally understood how purely beneficial and instructive these conferences are it is difficult to believe that any company will wish to remain permanently aloof.

Prominent Insurance Man Passes Away

M. F. RHODES, President of the Oregon Fire Relief Association died at his home in McMinnville, Oregon, on March 8, 1927, after having served 21 years as President of the Association.

When a young man he engaged in the insurance business in McMinnville, Oregon, in connection with his brother, M. D. L. Rhodes, now Secretary of the Northwestern Mutual Fire Association. Later on he was admitted to the Bar, practiced law for a few years and served one term as County Judge of Yamhill County, Oregon. He resigned this position to become President of the Oregon Fire Relief Association in 1906. From that time on he devoted his entire time to the work of the Association. He was careful and conscientious in his work, studying mutual insurance carefully, always ready to adopt anything that would better his company or the mutual insurance situation in the West. The growth of the Association during the time he was connected with it attests to his success as a mutual insurance man.

He attended three of the National Conventions; those held in Portland, Oregon, Peoria, Illinois and Boston, Massachusetts.

Mr. Rhodes will be especially missed among mutual insurance men on the Pacific Coast and the entire mutual world regrets his passing away.

Association Offices To Be Moved

THE Journal of American Insurance, the American Mutual Alliance, the National Association of Mutual Casualty Companies, the National Association of Automotive Mutual Insurance Companies, and the Federation of Mutual Fire Insurance Companies will, after June 1st, be located in their new offices at 180 North Michigan Avenue, Room 2200.

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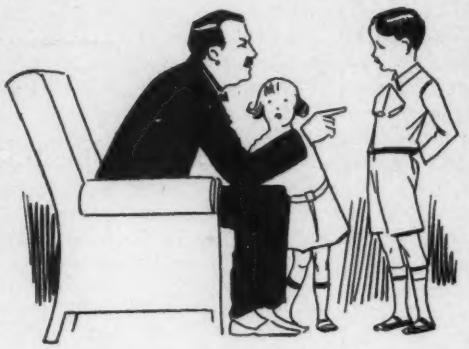

Sometimes when you lie awake nights and the stream of traffic courses through your mind — and your imagination's eye pictures the score of terrible accidents that could happen—

You're glad and thankful that your kids are safely tucked away in their beds.

You have great cause to be thankful when you consider that 4,500 school children, between the ages of 5 and 15 were killed by motor cars in 1925.

You can protect the lives of other children by being a careful driver—and you can help your children protect themselves by teaching them the rules of safety.

The rules are very simple. You can illustrate them easily. But children only learn by constant repetition. Hold your school three times a week. Make them recite each session. And you'll inculcate in them a sense of danger—a sense of care—the sense of safety.

Help reduce the number of accidents. Think safety.

* * *

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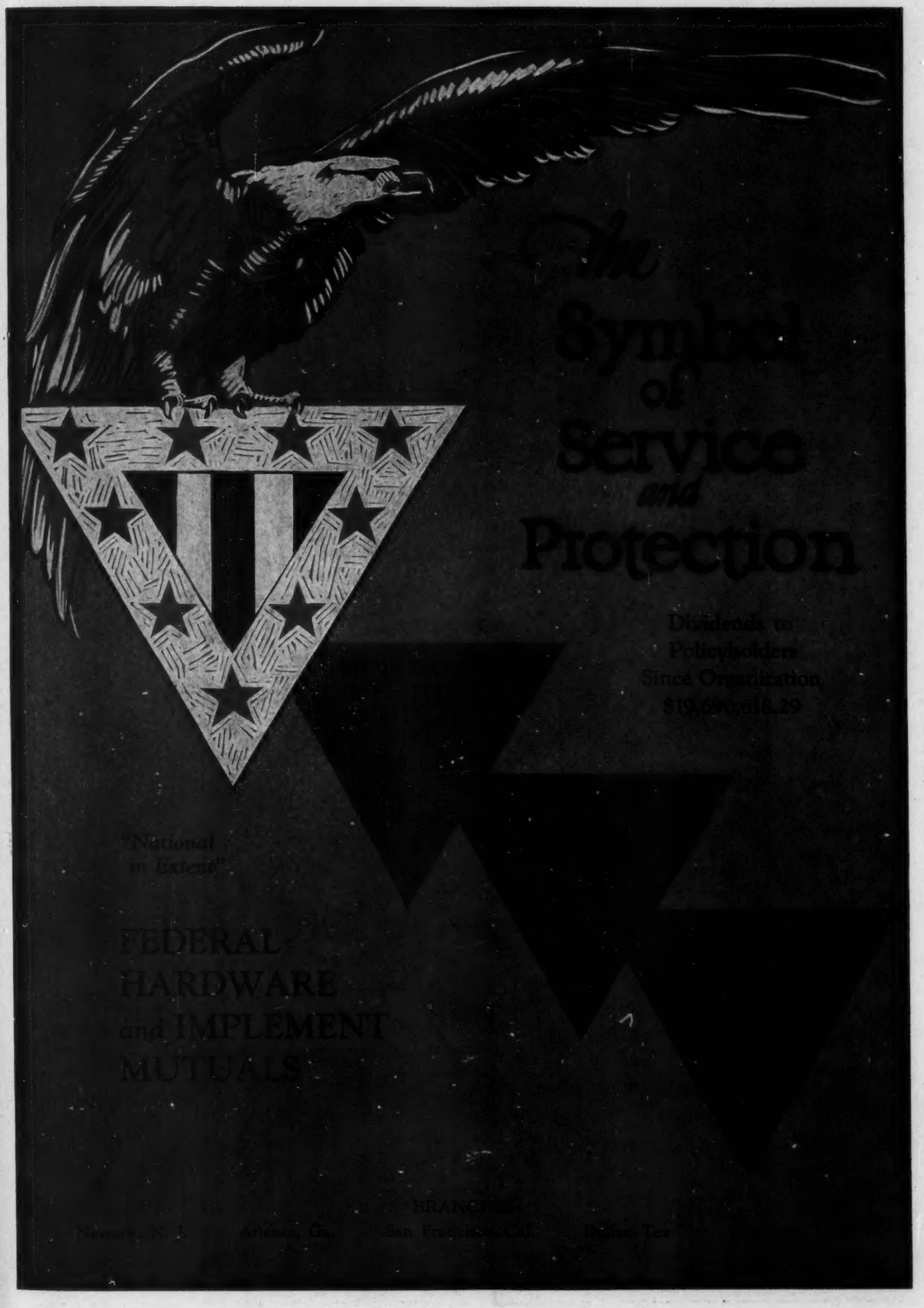
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